NOV 12 1954

A·I·B·S

bulletin

NEWS AND VIEWS IN THE BIOLOGICAL SCIENCES

Vol. IV APRIL • 1954 No. 2

The Challenge of Biology 9
PAUL WEISS

The Biological Sciences and the Fulbright Program 23
FRANCIS A. YOUNG

The Biologist in the Army Medical Service 25
ARVEY C. SANDERS

The Future Scientists of America Foundation 26
JOHN H. WOODBURN

The Proper Titling of Medical Papers 31
SEYMOUR I. TAINE and ROBERT L. HAYNE

El Dorado (Editorial) 10

Across the Editor's Desk 11

From the Editor 14

From the Societies 15

The AIBS Reports 16

The Biology Library 16

Private Bibliographies 20

Advanced Registration and Housing Information 28

•

published by THE AMERICAN INSTITUTE OF BIOLOGICAL SCIENCES

THE AMERICAN INSTITUTE OF BIOLOGICAL SCIENCES

DIVISION OF BIOLOGY AND AGRICULTURE

NATIONAL RESEARCH COUNCIL

2101 Constitution Avenue • Washington 25, D. C.

OFFICERS

Chairman: T. C. Byerly,
Bureau of Animal Industry, Beltsville, Maryland

Vice-chairman: J. C. Walker,
University of Wisconsin, Madison, Wis.

Executive Director: Frank L. Campbell,
2101 Constitution Avenue, Washington, D. C.

Deputy Executive Director: Hiden T. Cox,
2101 Constitution Avenue, Washington, D. C.

Convention Director: Hiden T. Cox

MEMBER SOCIETIES

American Bryological Society
American Physiological Society
American Phytopathological Society
American Society for Horticultural Science
American Society of Ichthyologists and Herpetologists
American Society of Naturalists
American Society of Parasitologists
American Society of Plant Physiologists
American Society of Plant Taxonomists
American Society of Zoologists
Botanical Society of America
Ecological Society of America
Genetics Society of America
Mycological Society of America
National Association of Biology Teachers
Poultry Science Association
Society for the Study of Development and Growth
Society of General Physiologists

AFFILIATE SOCIETIES

American Association of Anatomists
American Dairy Science Association
American Genetics Association
American Ornithologists' Union
American Society of Human Genetics
American Society of Limnology and Oceanography
Association of Southeastern Biologists
Potato Association of America
Society of American Foresters
Society for Industrial Microbiology
Society of Protozoologists
Society for the Study of Evolution

ASSOCIATES

Abbott Laboratories
The American Tobacco Company
Associated Seed Growers, Inc.
Baxter Laboratories, Inc.
Cutter Laboratories
Difco Laboratories
Eaton Laboratories
General Biological Supply House
Hercules Powder Company
Hoffman-La Roche, Inc.
Lilly Research Laboratories
Monsanto Chemical Company
C. V. Mosby Company
Charles Pfizer & Company, Inc.
W. B. Saunders Company
Schering Corporation
Squibb Institute for Medical Research
Upjohn Company
F. H. Woodruff & Sons, Inc.

THE AIBS BULLETIN

Editor, Frank L. Campbell; *Managing Editor,* Ileen E. Stewart

EDITORIAL BOARD

Ronald Bamford, *chairman*
University of Maryland
Ralph E. Cleland,
Indiana University
Clarence J. Hylander,
Bel Air, Maryland
Bentley Glass,
Johns Hopkins University

Published 5 times a year in January, April, July, August, and October.

Copyright 1953 by the American Institute of Biological Sciences, 2101 Constitution Avenue, Washington, D. C.

Subscription prices: $2.00 a year (50 cents a copy; August program issue $1.00) and to affiliate members, $1.00 a year; Canada, South America & Central America, $2.50; all other foreign, $3.00. August program issue mailed to participating Society Members only. Address all communications to the Executive Director, American Institute of Biological Sciences, 2101 Constitution Avenue, Washington, D. C. Entered as second class matter at the Post Office, Washington, D. C. Printing and typography: Judd & Detweiler, Inc., Washington, D. C. Advertising rates and information mailed on request.

New (2nd) Edition!

Conant, Smith, Baker, Callaway & Martin—
Manual of Clinical Mycology

The increasing incidence of fungus infections has correspondingly increased interest in the study of mycology—and the *New (2nd) Edition* of this manual reflects recent investigation in the field. Included are the laboratory examination, cultures, mycologic diagnosis, pathology and immunology for each type of infection; and recent advances such as: the periodic acid Schiff stain for the demonstration of fungi in tissues; the use of antigens for the detection of antibodies in the sera of patients having coccidiomycosis, histoplasmosis and blastomycosis, etc.

By Norman F. Conant, Ph.D., Professor of Mycology, Duke University School of Medicine; David Tillerson Smith, M.D., Professor of Bacteriology, Duke University School of Medicine; Roger Denio Baker, M.D., Chief, Laboratory Service, Veterans Administration Hospital, Durham, N. C.; Jasper Lamar Callaway, M.D., Professor of Dermatology, Duke University School of Medicine; and Donald Stover Martin, M.D., Chief, Bacteriology Section, Communicable Disease Center, Chamblee, Georgia. 456 pages, 5⅜″ x 7¾″, with 202 illustrations. $6.50. *New (2nd) Edition!*

New (2nd) Edition!

Mackie, Hunter & Worth—
Manual of Tropical Medicine

This is an important revision! It combines the basic material of a textbook of parasitology with the clinical management, control and prevention of tropical diseases. For the *New (2nd) Edition* it has been extensively revised to cover the drastic changes which have occurred in the knowledge and treatment of tropical diseases in the last 8 years. New chapters cover the virus encephalitides, trachoma, nutritional diseases, effects of heat, epidemic hemorrhagic fever and medically important molluscs, etc.

By Thomas T. Mackie, M.D., Colonel, M.C., A.U.S. (Retired); Chairman, The American Foundation for Tropical Medicine; George W. Hunter, III, Ph.D., Colonel, M.S.C., U.S.A.; Chief, Section of Parasitology-Entomology, Fourth Army Medical Laboratory, Brooke Army Medical Center; and C. Brooke Worth, M.D., Field Staff Member, Division of Medicine and Public Health, The Rockefeller Foundation. 907 pages, 6″ x 9″, with 304 illustrations. *New (2nd) Edition—Ready Soon.*

W. B. SAUNDERS COMPANY

West Washington Square **Philadelphia 5**

▶ ▶ Important Recebok

FRESH WATER from the OCEAN—*For Cities, Industry, and Irrigation*

Cecil B. Ellis *and Staff Members,*
Nuclear Development Associates, Inc.

JUST PUBLISHED—Critical investigation into the economic feasibility and basic physics of the various methods of extracting fresh water from the ocean, on the basis of gaining 1000 million gallons per day required by modern cities and good-sized irrigation projects. Analyzes existing and proposed methods in terms of all major cost elements—plant construction, operating labor, maintenance, raw materials, power requirements, etc. *A Conservation Foundation study. 50 ills.* $5

VEGETATION and WATERSHED MANAGEMENT

E. A. Colman, *U. S. Forest Service*

NEW—Provides the first systematic appraisal of the methods of managing vegetation in watersheds to increase ground water supplies, check soil erosion and siltation, and reduce flood peaks. Indicates the methods by which the character of vegetation—its structure, kind and density—can be radically changed to improve hydrologic processes of runoff, infiltration, storage, etc. Includes all recent research. *A Conservation Foundation study. 34 ills., 412 pages.* $7

WILDLIFE in ALASKA—*An Ecological Reconnaissance*

A. Starker Leopold, *University of California; and*
F. Fraser Darling, *University of Edinburgh*

A NEW AND TIMELY report on a significant investigation into the state of wildlife—particularly caribou, moose, and reindeer—in Alaska. Discusses the impact of human settlement upon wildlife habitat, big game in the Alaskan economy, and the utilization of the great horned animals as a recreational resource in light of present and future land use. Stresses the urgency and the opportunities for far-sighted planning. *A Conservation Foundation study. 28 ills.* $2.75

WAYS of MAMMALS—*In Fact and Fancy*

Clifford B. Moore, *Director, Forest Park Museum, Springfield, Mass.*

FOR EVERYONE who loves animals, here are the facts behind the myths and superstitions that pervade the world of mammals. From domestic animals to beasts of the jungle, this new book describes the fascinating, often misunderstood life habits and adaptations of many kinds of animals. Discussions are based on the work of noted zoologists. Includes several sections by authorities on particular aspects of animal behavior. *273 pages.* $3.50

RESOURCES and the AMERICAN DREAM

Samuel H. Ordway, Jr.

JUST OUT—This realistic, far-sighted report by an outstanding conservationist comes to grips with the fundamental problem of America's dwindling natural resources. A sober warning to the "Cornucopians," the book shows how overconsumption of raw material can and must be brought into balance with supply if our culture is to endure. Suggests plans for long-range use of our land and voluntary limitations on many areas of industrial output, and how these will help solve America's most serious conservation problem. $2

The Ronald Press Compa

ecebooks from Ronald ◀ ◀

FRESH WATER INVERTEBRATES of the UNITED STATES

Robert W. Pennak, *University of Colorado*

HERE IS the first comprehensive study of this subject since 1918. A new, up-to-date manual for biologists, zoologists, and advanced college students, it draws upon more than 5000 sources. Throughout, the author emphasizes the natural history, ecology, and taxonomy of free-living, fresh-water invertebrates of this country. It includes keys to all taxonomic groups, numerous photographs and line drawings. Bibliographies. *482 ills., 769 pages.* $14

MANUAL of the NORTH AMERICAN SMUT FUNGI

George W. Fischer, *State College of Washington*

INCLUSIVE GUIDE gives a taxonomic account of all presently recognized and classified smuts of North America—for plant pathologists, mycologists, and agronomists. Includes 22 genera, 276 species, and a few varieties on species of 242 host genera—with photographs of most smuts. The concept of species is based primarily on morphology; and host nomenclature conforms to best recent usage. Hosts are listed geographically, and there is a host genus index and key. *136 ills., 343 pages.* $8.75

THE SMUT FUNGI—*A Guide to the Literature, with Bibliography*

Also by **George W. Fischer**

TIME-SAVING reference work, providing a quick, accurate introduction to the literature on the biology and control of some 330 species of smut fungi and the diseases they cause. Makes available the entire range of published information in the field. Subject-matter guide subdivides, under each smut species, all pertinent data. Contains a 157-page bibliography representing more than 3000 scientific bulletins, papers, and books. *387 pages.* $8.50

THE SECRET of the GREEN THUMB

Henry T. Northen *University of Wyoming; and* **Rebecca T. Northen**

SUPERBLY ILLUSTRATED new work gives a real understanding of plant structure, how plants grow, and how they react to their environment. Here are the scientific facts behind gardening rules for the care of plants. Gives information on how to water plants, keep them free of pests and disease, and factors that make plants flower. Discusses plant breeding in detail, includes latest research on plant hormones and soilless culture. *259 ills., 430 pages.* $5

THE CULTIVATION of ANIMAL and PLANT CELLS

Philip R. White, *Roscoe B. Jackson Memorial Laboratory*

READY NOW—A technical and theoretical treatment of laboratory culture methods stressing the cell as the basic physiological entity in the formation of organisms. Presents, in simple, concise language, detailed accounts of major techniques of both plant and animal cell culture—to help investigators isolate, cultivate, and use cells as research tools. Contains an extensive bibliography reflecting changes in the field. *67 ills.* $6

East 26th Street. New York 10. N. Y.

· Frontiers in Laboratory Sciences ·

Laboratory Manual for INTRODUCTORY MYCOLOGY

ALEXOPOULOS - BENEKE

•

INTENDED to help the student systematize laboratory studies on fungi, this manual is designed for students who have a good understanding of biological principles. It includes only those fungi most commonly found and used for classroom study. Part I deals with useful methods for the study of fungi and Part II with the Achlorophyllous Thallophytes.

Descriptive illustrations and a complete glossary of technical words and terms serve to stimulate and increase student interest in the subject.

1952 Edition; 178 Pages
Price $3.25

MOSSES: A New Approach to the Identification of Common Species

By EMMETT T. BODENBERG

•

A COMPREHENSIVE book which is a step-by-step identification guide to the common mosses in the United States. The author, a ranger-naturalist for 13 summers, has included a practical and convenient outline on moss habitat, growth habits, time of fruiting and range. Detailed drawings, photographs and clear instructions make this book one of the most unique and inclusive works ever published for the laboratory and field study of the subject.

Copyright 1954; 275 Pages
Price $5.00

PHARMACOGNOSY LABORATORY MANUAL

QUIMBY-VANDERWYK-HASSAN

•

THIS BOOK is designed to acquaint the student of pharmacognosy with the drugs and drug products produced from plants and animals. Section I of the manual describes several microchemical methods commonly used in isolating and identifying the active constituents of biological drugs. Section II is devoted to plants that produce harmful effects. It deals with those drugs which yield official constituents. A valuable account of an important phase of biology.

Copyright 1953; 117 Pages
Price $3.00

BURGESS PUBLISHING COMPANY 422 SOUTH SIXTH STREET MINNEAPOLIS 15, MINNESOTA

Reprint ready April 1954:

Gustav Lindau and Paul Sydow

THESAURUS LITTERATURAE MYCOLOGICAE ET LICHENOLOGICAE RATIONE HABITA PRAECIPUE OMNIUM QUAE ADHUC SCRIPTA SUNT DE MYCOLOGIA APPLICATA QUEM CONGESSERUNT G. LINDAU ET P. SYDOW

5 volumes, Berlin, 1908-17, 3,652 pages
Cloth bound set, $100.00

The first three volumes of this standard work consist of a carefully compiled record of all known publications on mycology (including lichenology and plant pathology) up to and including 1910. Listings are made chronologically by authors.

Two additional volumes present the same material topically under such headings as geographical distribution, fungus groups, crops involved as hosts, etc. This set, long out of print, is invaluable to workers in mycology and plant pathology, supplying the necessary historical background through its bibliography.

JOHNSON REPRINT CORPORATION

125 EAST 23 STREET, NEW YORK 10, N. Y.

NEW MOSBY BOOKS!

Gebhardt-Anderson's

MICROBIOLOGY

Conforming to the current trend in basic scientific education for general university or college students, the authors have taken a simple and thorough approach in writing MICROBIOLOGY for these students.

Practical applications of microbiology in the student's daily life are stressed, so that not only the scientific but also the useful, practical point of view is gained. The basic concepts of microbiology are presented in such a manner that the average college student, with few prerequisites in either chemistry or biology, can digest and fully understand.

The first section of the text deals with the basic and fundamental principles of microbiology; the second section deals with sanitary and industrial microbiology; the third part deals with the disease-producing microorganisms—pathogenic microbiology. All three aspects are important for a rounded general knowledge of the subject.

The material on the pathogenic bacteria has several purposes. It shows the many microbial diseases to which we all may become heir. Second, it points up the seriousness of some of these disease agents. Third, it stimulates intelligent thinking in the event such disease develops—thus preparing the student of microbiology for *life*—as he will find it when he is finished with textbooks.

By LOUIS P. GEBHARDT, Ph.D., M.D., Professor and Head, Department of Bacteriology, College of Medicine, University of Utah; and DEAN A. ANDERSON, M.S., Ph.D., Professor of Microbiology, Chairman, Division of Natural Sciences; Los Angeles State College of Applied Arts and Sciences. 395 pages, 49 illustrations. Price, $5.75

Laboratory Instructions in

MICROBIOLOGY

Although this manual is written by the authors of the text (described above) and designed as a companion to the text, it is done so that it can be used successfully with other texts. It contains a large number of experiments, many of which have been used repeatedly by the authors in their laboratories.

It matches the text in simplicity of presentation for practical purposes and by using experiments that require only a minimum of equipment, materials and effort. It provides many more experiments than can be performed in the time allotted to give the instructor a wide choice for laboratory demonstration.

By LOUIS P. GEBHARDT, Ph.D., M.D. and DEAN A. ANDERSON, M.S., Ph.D. 253 pages, illustrated. Price, $3.25

Send orders and teacher inquiries to 3207 Washington Blvd., St. Louis 3, Missouri

PUBLISHED BY—

The C. V. MOSBY *Company*

Scientific Publications

SAINT LOUIS SAN FRANCISCO NEW YORK

Announcing

TWO NEW

HARPER TEXTS

for

INTRODUCTORY

BIOLOGY CLASSES

Just Published

PRINCIPLES OF BIOLOGY

By W. GORDON WHALEY, OSMOND P. BRELAND, CHARLES HEIMSCH, AUSTIN PHELPS, GLENN S. RABIDEAU

University of Texas

This text is a major contribution to the teaching of general biology. Sound and scientific in content, broad in scope, interesting in presentation, and exceptionally teachable, it is the result of eight years of experimentation by the biological science departments at Texas to work out a course in general biology to replace basic courses in the various branches of the science.

Concentrating on the key principles of biology, the text gives the student a full picture without overemphasis of any aspect. The dynamic character of biology is emphasized. (Two of the authors are zoologists, two are botanists, one is a physiologist.)

Building upon the aspects with which the student is familiar, the authors place early emphasis upon the higher plants and man. Properties of protoplasm and the cell are treated later. But the text is developed in essentially complete units, so that the instructor can follow any preferred sequence of topics.

The text contains more than 300 outstanding illustrations, all prepared especially for it.

694 pages ***$6.00***

LABORATORY STUDIES IN BIOLOGY

By ADDISON E. LEE and OSMOND P. BRELAND

University of Texas

Although this manual was developed at Texas, and will be used there with PRINCIPLES OF BIOLOGY, it is designed to be used with any standard text, and preliminary editions have been used in a number of institutions.

It provides a thorough coverage of selected subjects instead of trying to cover the whole field. Photomicrographs and drawings are printed side by side to assist the student in his use of the microscope and his understanding of structure. Emphasis is upon recognition and labeling rather than on drawing. The foetal pig, available from any biological supply house, is used as the laboratory "type animal," because of its closer relationship to the higher animals than the usual laboratory frog.

253 pages ***$3.50***

HARPER & BROTHERS

Established 1817

49 East 33d Street

New York 16, New York

Important Holt Texts in Biology

COLLEGE BOTANY

By HARRY J. FULLER and OSWALD TIPPO. Revised Edition. An extensive, evolutionary study of plant groups, with special emphasis on practical applications based on the structural and physiological features of plants. The text is now revised to insure modern treatment throughout. Excellently illustrated, it contains nearly 300 specially-made drawings, as well as 276 photographs. Chapter summaries, study questions, and up-to-date bibliographical references. Ready in April, $6.90

THE PLANT WORLD

By HARRY J. FULLER. Revised edition. The revision of this outstanding general botany text stresses the practical aspects of plant life which are involved in everyday experience. Chapter summaries, review questions, and references. More than 400 illustrations. 1950, 769 pages, $5.25

THE LIVING BODY

By CHARLES H. BEST and NORMAN B. TAYLOR. Third Edition. This famous basic text for the course in human physiology includes a new introductory chapter on general chemical and physicochemical principles, 300 illustrations, improved color plates, and material on the latest advances in the field. 1952, 792 pages, $6.00

Lillie's DEVELOPMENT OF THE CHICK

Revised by HOWARD L. HAMILTON. Advisory Editor, B. H. WILLIER. Third Edition. This classic introduction to embryology presents a comprehensive account of the development of the chick. The 283 illustrations include 17 full-page plates. 1952, 624 pages, $8.50. Revised Brief Edition, 1953, 291 pages, $4.50

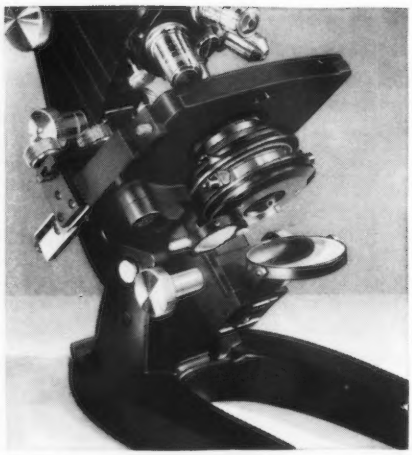
PRINCIPLES OF MODERN BIOLOGY

By DOUGLAS MARSLAND. Revised Edition. A complete reconstruction and modernization of Charles W. Plunkett's *Elements of Modern Biology*. Drawings and photographs. 1951, 757 pages, $5.75

Henry Holt and Company, 383 Madison Ave., N. Y. 17

NEW!

Full Field Illumination of Low Power Objectives



THE NEW AO No. 231 Auxiliary Condenser has proven so effective in brilliantly filling the field of 3.5X and 5X objectives that we are adding it as standard equipment on many microscope models.

You may enjoy this new convenience on your AO Microscope (Series 15 and 35), for it is easily attached to the standard condenser mount. The standard Abbe condenser is focused only once—for high power objectives. Then the Auxiliary Condenser is merely swung in and out of the optical path as needed. There's no need to remove any substage element, or respace condenser.

American Optical
INSTRUMENT DIVISION
BUFFALO 15, NEW YORK

The No. 231 Condenser is a valuable accessory. Ask your dealer for further information or write Dept. 000.

EDITORIAL

Reprinted from *Science* 118: 33-34, 1953

The Challenge of Biology

PAUL WEISS

Professor of Zoology, University of Chicago, and
Chairman, Division of Biology and Agriculture, National Research Council

THIS is the century of the biological sciences. The physical sciences have already achieved a high degree of consistency and conceptual maturity. In the life sciences, on the other hand, analytical understanding is still no more than rudimentary, unifying concepts are still scarce, and many fundamental principles remain to be discovered. The major job still lies ahead. At the same time, the urgency of the task grows, as mankind looks expectantly to new advances in agriculture, public health, and medicine, whose rational development depends on biological knowledge and understanding.

The biological sciences strive to measure up to the challenge. They are hitting an ever swifter stride and, being young, move on with optimism to a future full of opportunities and promise of fulfillment. Yes, biology is on the march. Its gathering momentum is gratifying; it also holds its dangers.

For in its fast advance, biology tends to break up into isolated columns, splintering into ever more subdivisions of specialization and particularization. Mastery requires concentration, and concentration is aided by seclusion. Thus, breaking up the larger tasks into narrower fragments is necessary for success. But unless the common goal—the understanding and control of life processes—is constantly kept in view as the beacon for the individual columns by which to chart their courses, they will lose contact, common purpose, and direction. *The unity of life* must find its true reflection in *unity among the biological sciences.* Beyond our preoccupation with our special interests, as anatomists, bacteriologists, cytologists, dendrologists, endocrinologists, geneticists, histologists, immunologists, limnologists, mammalogists, neurologists, oncologists, physiologists, radiologists, serologists, taxonomists, virologists, and zoologists, we must remain, above all, biologists, at least in spirit and allegiance, if not in performance.

Being a biologist is an attitude, not an occupation. Biology has grown in volume and diversity to the point where it would be far beyond the capacity of any one individual to acquire competence in more than a limited sector of the field. Biologists, in the sense of miniature incarnations of universal biological knowledge, no longer exist. Biological science has become a group enterprise with many servants in varied stations. The single-celled organism has evolved into a multicellular one, and its health, survival, and growth depend on the harmonious cooperation of its many specialized members. Anyone contributing to this collective task, constructively, competently, and conscientiously, thus becomes a biologist. Consequently, it takes all kinds of biologists to make the biological world, none of them able to carry on without the others. And biology needs their full diversity.

It needs the observer, the gatherer of facts, the experimenter, the statistician, the theorist, the classifier, the technical expert, the interpreter, the critic, the teacher, the writer. It needs the student of evolutionary history as much as it does the experimental physiologist; the precise recorder of morphological data as much as the analytical biophysicist and biochemist; the investigator of molecular interactions as much as the student of supramolecular organization, of the order of events in space and time. It needs the help of all hands at all stations, from the research man who conceives a new idea, to the assistants who prepare solutions or tend cultures or animals; from the mechanic who builds a new instrument, to the artist or photographer who prepares indelible records of microscopic specimens or physiological tracings; and last, not least, from the man who willingly gives of his time and effort in order to help obtain and distribute some of the most basic tools of science—fellowships, research grants, materials and jobs—to the one who willingly accepts them to good advantage. They all work for a common cause and should feel above the unjustified and undignified popularity contests that center on such monomaniac questions as who is "more important," the "fundamental" or the "applied" scientist; the explorer or the instructor; the technical expert or the philosopher. They are all needed—in their proper stations. And they should be rated not by *what* they are doing but by *how* they are doing it.

Competence, resourcefulness, scholarship, craftsmanship, imagination, self-criticism, discipline, honesty, responsibility, and logical clarity are the only valid criteria of merit; not whether one devotes himself to exploring the vegetation of the jungle or the permeability of a cell membrane. Good work in any line will bring success. Given some luck, discoveries will come abundantly, as Pasteur said, to the "prepared mind." Opportunities are the richer, the wider the field and the more there is yet to be discovered; chances the better, the more freely an individual of good sense can strike out for himself, free from the tyranny of fashion and the lure of popularity. In biology, in its campaign to conquer the unknown, the field is so broad, so much is yet to be discovered, ordered, and explained, and there is so much freedom yet for initiative and self-direction that rich yields await the curious, imaginative, resourceful, and courageous. Yet, as the freshly mined raw materials of new knowledge are fed in ever increasing volume into the processes of sorting, polishing, recording, distribution, storing, and application, even those who by inclination or talents have taken stations in this processing network behind the front lines of research will reap their share of credits and rewards, as they themselves take an essential share in the accomplished product: the advance of the biological sciences.

Of course, reward is counted not only in economic terms, but more in terms of intellectual and emotional satisfaction—the thrill of discovery, the pride of achievement, the sense of service to man and his welfare. Being young and in the ascendancy, biology can promise the members of its family more of these rewards than most other fields of science. What is more, being highly diverse and relatively undeveloped, it offers the *individual* more latitude of personal choice and broader opportunity for the expression of his personal talents than older, more standardized and grooved endeavors.

Therefore, biology has room for a very wide range of personalities and trainings; while for its frontline advances it needs the best of brains and eyes, and hands, it is no less dependent on the large corps of comrades in arms who support, consolidate, exploit, and enlarge those advances. All it takes to join these forces is: some aspirations, to point the goal; some inspiration, to point the way; and perspiration, to get you there. What can you get out of it?—a happy and a useful life.

El Dorado

ON February 13, 1954 Charles Lathrop Parsons came to the end of his long and useful life. From 1907 through 1945 he was Secretary of the American Chemical Society, and he will long be remembered as its "chief architect and guiding genius." Many a biologist looks with envy upon the American Chemical Society as it is today, the voice of American chemistry, serving its members through its great news, industrial, scientific, and abstract publications and reaching the public through the press, radio, and television. And many a biologist must wonder why American biology is so weak, relative to chemistry, in the services just mentioned.

It should be encouraging to biologists to know that the American Chemical Society did not reach its present powerful state without difficulty. In the years of his secretaryship Dr. Parsons was able to convince chemists that their interests would be best served by building a strong national organization to which all kinds of chemists could belong and under which the necessary expression of specialization and local needs could develop (as divisions and sections) with the growth of the Society.

Organizationally, biology has followed a different course. Budding off from the American Association for the Advancement of Science and from each other, different societies representing different biological specialties were formed and are still being formed. Biology can never be organized in the pattern of the American Chemical Society: existing loyalties and terminology stand in the way. We can, however, and must build a stronger and more inclusive association of biological societies than we now have, if biologists are to do their utmost for themselves, their science, and the public.

The American Institute of Biological Sciences is growing in membership, the most recent member being the National Association of Biology Teachers. Because biological education is the bedrock of biological science, we welcome the biology teachers and rejoice in their adherence to AIBS. And yet, strange to say, their membership in AIBS does not strengthen the Institute financially. This anomaly requires explanation.

The present by-laws state that "no society . . . shall be billed for more than $1,000 in any one year." Therefore, the individual contributions of biologists through their society dues to AIBS will decline as the numbers of members increase. Those who wrote this provision into the by-laws evidently did not foresee the publication of the *AIBS Bulletin*, which would go to all members of member societies. If they had visualized a publication service to members, they would have provided for income in direct proportion to the number of individuals receiving the publication.

At present the sum of dues received from member societies is insufficient to pay for the cost of production and distribution of the *Bulletin* to members of those societies. Should we stop publishing the *Bulletin* in order to live within our anticipated income? Or should we take steps to get the additional income needed to continue publishing the *Bulletin* and to improve it? To choose the first course would be equivalent to abandoning the AIBS, for there has never been an effective national scientific organization that did not have at least one publication to promote its purposes and bind its members together. Assuming that biologists will choose to support AIBS and its *Bulletin*, let us examine the situation further.

We must face rising costs of publication, declining income per person from those receiving the *Bulletin*, and the termination on June 30, 1954, of a grant from the Rockefeller Foundation, which has partially subsidized the publication of the *Bulletin*. We do not recommend that another grant be sought, but rather that we biologists resolve to be self-supporting. It can be done very simply and without great sacrifice if each person who receives the *Bulletin* will pay for it.

At present each person who receives *Science* or the *Scientific Monthly* pays the AAAS $6.50 per year; each member of the ACS who receives *Chemical and Engineering News* pays $12.00 per year; in 1953 each member of AIBS societies who received the *Bulletin* paid the Institute, on the average, 80 cents for the *Bulletin* and all other services. The average in 1954 will be less!

At its annual meeting on May 14 the Governing Board of AIBS will wrestle with the problem of providing additional income in the most equitable manner. The problem will be discussed also, we hope, in various groups, official and unofficial, at the Annual Meetings of AIBS at the University of Florida, Gainesville, September 5-9, 1954.

Comparing ACS and AIBS, one does not require much imagination to picture what AIBS might become in a single generation. Given adequate support, the *Bulletin* would be published bimonthly, monthly, biweekly, and, finally, weekly with continuously improving content and format and more and more advertising. Its "news and views" would improve in timeliness with increasing frequency of publication and with the reportorial services that would be developed. Concurrently a public relations program would be established and its growth fostered. Services of various kinds to biologists and biology would be undertaken or expanded. All this is possible if American biologists want it.

F.L.C.

Across the Editor's Desk

• **The Duke University Marine Laboratory** at Beaufort, N. C. and the **Mountain Lake Biological Station will offer courses in *Radiation Biology*** during the summer of 1954. These courses will be implemented by visiting lecturers from the Biology Division of the Oak Ridge National Laboratory.

During the first part of the summer (June 9-July 17) an introductory course, which will deal with the basic physical, chemical and biological principles upon which study of the biological effects of radiation is based, will be offered at Beaufort, N. C. It will consist of three sections: *Radiation Physics, Radiation Biochemistry,* and *Radiation Physiology.* Those interested in this course should write to: Dr. C. G. Bookhout, Director, Duke University Marine Laboratory, Durham, North Carolina.

Later in the summer (July 22-August 25) a more specialized course which will emphasize the cytological and cytogenetic effects of radiation will be offered at the Mountain Lake Biological Station. This course also will consist of three sections: *Radiation Microbiology, Radiation Cytology,* and *Radiation Genetics.* Those interested in this course should write to: Dr. Bruce D. Reynolds, Director, Mountain Lake Biological Station, University of Virginia, Charlottesville, Virginia.

These two courses have been so scheduled and integrated that both may be taken during the summer, or either may be taken as a separate course. Each course carries 6 semester hours credit.

❖

• **The American Eugenics Society began publication of a new journal, *Eugenics Quarterly,*** in March, 1954. Chairman of the Editorial Board is Frederick Osborn; Managing Editor, Helen G. Hammons; C. Nash Herndon and Frank Lorimer are the other members of the Board and Gordon Allen and Clyde V. Kiser will serve as Consulting Editors. Subscription price of the new journal is $3.00 per year. Inquiries about the *Eugenics Quarterly* or membership in the American Eugenics Society should be addressed to the Secretary of the Society, Frederick Osborn, 230 Park Avenue, New York 17, N. Y.

❖

• **University faculty members are invited to apply for places in the Research Participation Program** carried out by the Oak Ridge National Laboratory and the Oak Ridge Institute of Nuclear Studies. Through this program, faculty members may carry out research in Oak Ridge, principally at the National Laboratory, for periods of from three months to one year. In general, participation should be for six months or more to be of maximum value both to the research worker and the laboratory concerned.

Payment while a person is on leave for research participation at Oak Ridge is equivalent to his university salary. Oak Ridge offers unusual research facilities in biology and biochemistry.

Application should be made approximately six months prior to actual participation. Application forms and additional information may be obtained from the University Relations Division, Oak Ridge Institute for Nuclear Studies, P. O. Box 117, Oak Ridge, Tennessee.

❖

• **The International Congress on Photobiology,** organized under the auspices of the Comité International de Photobiologie (C.I.P.), will be held in Amsterdam, August 23-28, 1954. In addition to contributed papers, the following three symposia will be held: (1) Photoperiodism in Plants and Animals; (2) The Effects of Non-ionizing Radiation on Genetic Elements of Cells; (3) The Fundamental Effects of Light on Skin. The Committee on Photobiology of the Division of Biology and Agriculture, National Research Council, has limited funds available, contributed by the National Science Foundation, for the support of this Congress.

For further details, please make inquiries to the Secretary of the American Branch of C.I.P., Dr. Alexander Hollaender, Oak Ridge National Laboratory, Biology Division, Box P, Oak Ridge, Tennessee, or, Secrétariat du Congrès C.I.P., Radiologisch Laboratorium, Wilhelmina Gasthuis, Amsterdam, Holland.

❖

• **Forthcoming international and foreign scientific and technical meetings** of interest to biologists:

May 14-June 7. Strasbourg, France. *First Congress on Scientific and Technical Progress* and European Exposition on Productivity.

May 29-June 5. Basel, Switzerland. *Eleventh International Ornithological Congress.*

June 7-12. Montreal, Canada. *Fourteenth International Congress of Psychology,* International Union of Scientific Psychology.

June 21-24. Macdonald College, Canada. *Agricultural Institute of Canada,* Annual Meeting in conjunction with Annual Meeting of Canadian Phytopathological Society.

June 22-25. London, England. *Ciba Foundation Colloquium on Endocrinology;* The Human Adrenal (Part II). (by invitation).

July 2-14. Paris, France. *Eighth International Congress of Botany.* International Union of Biological Sciences.

July 6-9. London, England. *International Conference on Electron Microscopy,* Joint Commission on Electron Microscopy of International Council of Scientific Unions.

July 13-15. London, England. *Ciba Foundation Symposium on Aspects of Ageing.* (by invitation).

July 19-23. London, England. *Third International Congress of Gerontology.*

July 23-29. São Paulo, Brazil. *Sixth International Cancer Congress,* International Union Against Cancer.

July 29-August 2. Copenhagen, Denmark. *International Union for the Protection of Nature,* Fourth General Assembly and Technical Meeting.

August 23-28. Leopoldville, Belgian Congo. *Fifth International Congress of Soil Science.*

August 23-28. Zurich, Switzerland. *International Congress for the Philosophy of Science.*

August 23-28. Amsterdam, The Netherlands. *International Photobiological Congress* (Fourth International Light Congress).

September 1-7. Leiden, The Netherlands. *International Society of Cell Biology, Eighth Congress.*

September 6-11. Paris, France. *International Society of Hematology, Fifth Congress.*

September 14-18. Amsterdam, The Netherlands. *Third International Congress of Nutrition.*

❖

• **Three Departments at the University of New Hampshire** have been authorized to start programs of graduate work leading to the Ph.D. degree, beginning February 1, 1954. These departments are Chemistry, Horticulture, and Botany. A catalog giving the requirements may be obtained from the Dean of the Graduate School, University of New Hampshire, Durham, New Hampshire.

❖

• **The Jackson Hole Biological Research Station** will be available for use by research workers in the biological sciences from June 10 to September 10, 1954, and at other times dur-

ing the year by special arrangements. This Station is administered by the University of Wyoming under agreement with the New York Zoological Society. The station is located at the foot of the Teton Mountains near Moran, Wyoming. Research projects in basic ecology, taxonomy, and behavior are encouraged. Opportunities for research in the practical aspects of conservation, game management, and fisheries biology are also available. Students will be allowed to register for credit at the University of Wyoming for research projects taken under the direct supervision of the professor in charge of the Research Station. All inquiries concerning this Station should be addressed to L. Floyd Clarke, Department of Zoology and Physiology, University of Wyoming.

❖

• Under a grant from the Rockefeller Foundation, **William C. Snyder,** Professor of Plant Pathology, University of California, will spend several months, beginning March 1, 1954, at the Commonwealth Mycological Institute, Kew, Surrey, England. He will work with British mycologists in an attempt to standardize the nomenclature of the fungus genus *Fusarium*. Dr. Snyder will present a paper on this subject at the Eighth International Botanical Congress in Paris in July.

❖

• **The Natural History Museum of Stanford University** has announced completion of the refitting of the main fish and herpetological collection room. This valuable collection contains about 750,000 specimens and is one of the most varied in the world, ranking only behind the great national collections in London, Paris and Washington. The entire project has cost the Museum about $30,000, nearly $28,000 of which has been raised by a graduate students' Zoology Project Fund Committee, which obtained gifts from the Museum's many alumni and friends.

❖

• **The 19th Cold Spring Harbor Symposium on Quantitative Biology** will be held June 7-14, 1954. The topic of the meetings will be ***"The Mammalian Fetus—Physiological Aspects of Development."*** The primary function of this year's Symposium will be to evaluate the principle morphological, physiological and biochemical factors that are essential for the immediate well-being and future development of the mammalian embryo. This will involve a consideration of hereditary-fetal and maternal-fetal relationships, as well as of the development and function of the membranes, decidua, and trophoblast of the conceptus. Attention will be focused on the homeostatic factors that contribute to normal somatic and visceral development of the embryo to meet the requirements of living before, during, and just after birth. Twenty-four of the participants will come from European countries, including Belgium, Finland, France, Great Britain, Ireland, The Netherlands, Norway, Sweden and Switzerland. The Symposium is being sponsored by the Carnegie Corporation of New York, the National Science Foundation and the Association for the Aid of Crippled Children. For program and information, address the Biological Laboratory, Cold Spring Harbor, New York.

❖

• **The Biological Laboratory, Cold Spring Harbor, is offering two specialized summer courses,** designed to acquaint research workers with the most important techniques used in bacterial virus research and bacterial genetics. The course on ***Bacterial Viruses*** will be held from June 21-July 10, with Dr. Mark H. Adams of New York University in charge; and ***Bacterial Genetics*** will be conducted from July 14-August 3 by Drs. E. M. Witkin, V. Bryson, M. Demerec, and staff. A limited number of fellowships covering part of the tuition fees are available for graduate students. Information about these courses may be obtained from the Biological Laboratory, Cold Spring Harbor, New York.

❖

• The Director of the **University of Minnesota Lake Itasca Forestry and Biological Station,** Dr. T. Schantz-Hansen, has announced that the 1954 Summer Biology Session will be shifted to the period, June 14 to July 17. This change will enable students to do field work at the height of the season and permit the addition of ornithological work to the station's program. The staff for the 1954 sessions will include, in addition to University of Minnesota men: Dr. Joseph Hickey, University of Wisconsin (Ornithology); Dr. Alvah Peterson, Ohio State University (Field Entomology and Immature Insects); Dr. Francis Drouet, Chicago Museum of Natural History (Algology). Courses given by University of Minnesota staff will include limnology, plant ecology, field mycology and animal ecology. Detailed information may be obtained from the Dean of Summer Sessions, 966 Johnston Hall, University of Minnesota, Minneapolis 14, Minnesota.

❖

• **The Rocky Mountain Biological Laboratory,** Crested Butte (Gothic), Colorado, will conduct its 27th annual session from July 1-August 11, 1954. Courses and facilities are open to graduate, advanced undergraduate students and independent investigators. The "Gothic Area," comprising about a half million acres of virgin territory, contains numerous high mountains, rivers and streams, lakes, bogs, swamps, mountain and alpine meadows and regions of perpetual snow. The elevation varies from 8,000 to 14,000 feet. Acting Director of the Laboratory for the Summer 1954 will be Dr. Wm. H. Emig, who will conduct a course in field botany. Other instructors will be: Dr. H. G. Barclay, University of Tulsa, and Dr. A. O. Weese, University of Oklahoma (ecology); Dr. Reginald D. Manwell, Syracuse University, and Col. George W. Hunter III, U. S. Army (parasitology); Dr. H. B. Sherman, University of Florida (mammalogy); Dr. C. D. Tollman, Colorado Game and Fish Commission, and regular staff (conservation). Courses will also be given in ornithology and field zoology. Until June 20th further information about the Laboratory may be obtained from Dr. John C. Johnson, Director of the Laboratory, 108 Meadville Street, Edinboro, Pennsylvania.

❖

• **Announcement has been made of the appointment of Dr. William H. Sutcliffe, Jr. as Director of the Bermuda Biological Station.** Since 1951 Dr. Sutcliffe has been a Staff Biologist at the Station; previous to that he was engaged in plankton investigations at the University of North Carolina Institute of Fisheries Research. Dr. Sutcliffe received his Bachelor's degree from Emory University and his Master's and Doctor's degree from Duke University, where his major subject was marine ecology and plankton.

The Bermuda Biological Station occupies a strategic position for the study of oceanographic problems. Oceanic pelagic, bathypelagic and deep-water benthic organisms can be obtained within a few miles of the Station while an extensive littoral coral reef fauna and flora are immediately at hand. A motor launch and a 61-foot research vessel, made available by the Colonial Government, are in commission to aid the field work of the laboratory. Laboratory accommodations with running seawater, ordinary supplies and equipment are available all year for about 25 investigators. A library is maintained. Living quarters in the form of rooms in the main building or cottages in the 14-acre Station property are provided.

Basic support for the Station has come from an endowment given by the Rockefeller Foundation in 1929. The land and buildings of the Station were provided by the Bermuda Government in 1927. The latter has continued to provide an annual

grant for general maintenance in addition to special sums for particular research projects and facilities. The Royal Society of London, the Woods Hole Oceanographic Institution and the American Philosophical Society have also made available considerable funds for research programs and fellowships. Membership in the Corporation of the Bermuda Biological Station is international and open to all those interested. The Officers and Trustees who comprise its governing board are from Bermuda, Canada, Great Britain and the United States. Inquiries about the laboratory's facilities and program should be addressed to the Director, Bermuda Biological Station, St. George's West, Bermuda.

❖

• The announcement in the January *AIBS BULLETIN* that **William C. Steere,** Stanford University, had accepted an invitation to serve as President of the 8th International Botanical Congress was in error. Dr. Steere has accepted an invitation to serve as Chairman of the Bryological Section of the Congress.

❖

• As a contribution to the meeting of the British Association for the Advancement of Science, to be held at Oxford, September 1-8, 1954, Imperial Chemical Industries Limited, **publishers of the quarterly scientific review, *Endeavour*, are offering the sum of 100 guineas to be awarded as prizes for essays** submitted on a scientific subject. The competition is restricted to those whose twenty-fifth birthday falls on or after 1st June, 1954. The subjects for the essays are as follows: (1) The Upper Atmosphere, (2) Heat of the Earth, (3) Coal as a Raw Material, (4) Water Supply, (5) The Span of Life, (6) Colour Photography. The essays should be submitted without signature, but with the competitor's full name and address and date of birth enclosed in a sealed covering letter. Manuscripts, which must be in English and typewritten, should not exceed 4000 words and should be submitted by June 1, 1954 to: The Assistant Secretary, British Association for the Advancement of Science, Burlington House, Piccadilly, London, W.1., England.

❖

• The trends, strains, and needs in the biological sciences are the principal areas to be studied by the **new Biology Council** of the Division of Biology and Agriculture of the National Research Council. Supported by several Government agencies interested in improving their biological research, the Biology Council is composed of sixteen eminent scientists who were carefully selected to include the whole field of biology—from molecular biology to environmental biology. They are not to advise on specific questions put to them by their sponsors, but to choose the subjects of greatest importance to the future development of biology. The first meeting was held January 22-23, 1954 and it was agreed to study such subjects as the conceptual framework of the life sciences, education, research trends, support of research, underdeveloped areas, biological collections, exploitation of biological knowledge, personnel and public relations. Education was regarded as of paramount importance for the future of biology and a subject so complex that the Biology Council would need the help of a special committee on Educational Policies. The subject of biological communications was assigned to the existing Publications Committee of the AIBS. The personnel of the Biology Council is as follows: *Paul Weiss,* Chairman, Chairman of Division of Biology and Agriculture, National Research Council; *Stanley A. Cain,* Professor of Conservation, School of Natural Resources, University of Michigan; *Jackson W. Foster,* Professor of Bacteriology, Department of Bacteriology, University of Texas; *Ralph W. Gerard,* Professor of Neurophysiology, Division of Psychiatry, Neuropsychiatric Institute, University of Illinois; *David R. Goddard,* Chairman of Department of Botany, University of Pennsylvania; *Richard Goodwin,* Professor of Botany, Connecticut College; *Caryl Haskins,* Director of Haskins Laboratories, New York; *Sterling B. Hendricks,* Head Chemist, Division of Soil and Plant Relationships, Agricultural Research Service, U. S. Department of Agriculture; *G. Evelyn Hutchinson,* Professor of Zoology, Osborn Zoological Laboratory, Yale University; *Berwind P. Kaufmann,* Senior Staff Member of Department of Genetics, Carnegie Institution of Washington, New York; *Ernst Mayr,* Alexander Agassiz Professor of Zoology, Museum of Comparative Zoology, Harvard University; *F. O. Schmitt,* Chairman of Department of Biology, Massachusetts Institute of Technology; *Edward L. Tatum,* Professor of Biology, Department of Biological Sciences, Stanford University; *Harold B. Tukey,* Head of Department of Horticulture, School of Agriculture, Michigan State College; *Sherwood L. Washburn,* Chairman of Department of Anthropology, University of Chicago; *Perry W. Wilson,* Professor of Bacteriology, Department of Bacteriology, University of Wisconsin.

❖

• **A Soil Microbiology Conference** will be held at Purdue University, June 21-24, 1954. It will be sponsored by the American Society of Agronomy, the Soil Science Society of America, and Purdue University. Reservations may be made direct through the Union Club, Purdue Memorial Union, West Lafayette, Indiana. The two-and-one-half-day meeting will feature papers by scientists and administrators, considering the place of soil microbiology in soil science and the contributions which microbiology may make towards the solution of agronomic problems. A question and discussion period will follow each paper.

❖

• On March 1, **Dr. A. G. Newhall** of the Department of Plant Pathology, Cornell University, arrived at the Agricultural College of the University of the Philippines, in Los Banos, where he will spend one year teaching and conducting research in plant pathology. He is replacing **Dr. G. C. Kent,** who has been in Los Banos for the past 18 months. Dr. Kent will resume his duties as Head of the Department of Plant Pathology, Cornell University, about June 1, after visiting several European universities on his return trip. Dr. Newhall and Dr. Kent are participating in the Cornell-Los Banos project, which is a cooperative undertaking of the Agricultural College of the University of the Philippines and Cornell University, through the Foreign Operations Administration. The purpose of this project is to assist in the rehabilitation of the Agricultural College of the University of the Philippines.

❖

• **Professor William Brown,** F.R.S., Professor Emeritus of Plant Pathology at the Imperial College of Science and Technology, University of London, has been appointed Visiting Professor of Plant Pathology at Cornell University, where he is teaching an advanced course on the subject of physiology of parasitism in plants. Professor Brown will return to Great Britain early in June, and will preside at the jubilee celebration of the Association of Applied Biologists in September 1954.

❖

• **The Highlands Biological Station,** Highlands, North Carolina, will be open to independent investigators and graduate students from June 1 to September 1, 1954. Situated at 4,000 ft. altitude, the station is located at the junction of the Appalachian Mountains and the Great Smokies. Flora and fauna of both northern and southern varieties exist in the region. Reservations are required for research tables and housing accommodations and should be addressed to the Dr. Thelma Howell, Executive Director of Highlands Biological Station, Wesleyan College, Macon, Georgia.

From the Editor

TO facilitate consideration of important facts and recommendations affecting the future of AIBS, a special editorial was written and was given a prominent place on page 10 under the title "El Dorado," a golden vision. In his essay on El Dorado, Robert Louis Stevenson concluded, ". . . to travel hopefully is a better thing than to arrive, and the true success is to labour." The small, competent, and devoted staff of AIBS have their eyes on an El Dorado for biology toward which they are traveling hopefully and successfully. They need to feel that they have the good will and support of the biologists they are serving, that they are part of an expanding, progressive organization, and that their increasing effectiveness will be recognized.

On February 25, 1954, the Executive Committee met in the AIBS office and gave attention to the current and future activities of the Institute. Those who have special responsibilities for AIBS projects reported to the Committee in person. Only a few subjects can be mentioned here.

Dr. E. C. Albritton, director of the project on the preparation of a *Handbook of Biological Data*, reported that the second fascicle, "Nutrition and Metabolism," has been completed in the form of photographic negatives of 160 tables. The fascicle will be published first by the principal sponsor, the Department of the Air Force. A copy of this 358-page book will be sent to each of the contributors, more than 800 of them, and to a limited Government distribution list. Later the book will be published commercially by the W. B. Saunders Company.

Dr. F. P. Cullinan, who, with Dr. J. S. Nicholas, represents AIBS on the Scientific Manpower Commission, reported that a professional agricultural society, not affiliated with AIBS, wishes to place its own representative on the Commission, or to be represented through a proposed association of professional agricultural societies that are not now affiliated with AIBS. There are now in AIBS three member societies and two affiliate societies whose interests are primarily in biology as applied to agriculture. Dr. Cullinan, of the American Society for Horticultural Science, can be regarded as speaking for the agricultural interests of AIBS on the Commission. He can also represent other professional agricultural societies before the Commission, and such societies have been invited to accept him as their representative and to contribute to the expenses of the Commission through AIBS. Thus the membership of the Commission would not tend to become unwieldy, and the solidarity of biology, as applied to agriculture, would be promoted. We hope, of course, that the societies of applied biology now independent of AIBS will not only go along with the Institute with respect to the Commission, but will join AIBS as member or affiliate societies. By so doing they would lose none of their present autonomy and professional *esprit de corps*, but would amplify the voice of biology in matters of common concern.

Dr. O. N. Eaton, Executive Secretary of the Institute of Animal Resources, reported progress in the accumulation of data on laboratory animals—data that are being supplied both by producers and users of such animals. Although initial emphasis is being given to such animals as rats, mice, rabbits, guinea pigs, and hamsters, other mammals, other vertebrates and invertebrates are not being overlooked. A preliminary "handbook," or tabular compilation of information about laboratory animals, will be issued in the near future.

Dr. Russell B. Stevens, who has undertaken to write the guidance booklet discussed in our last editorial, reported his progress on this assignment. He has completed a comprehensive outline and has written about half of the proposed text. Before completing the text, the trial run will be submitted to potential consumers to find out whether the style and content attract and hold their attention. Meanwhile, information for inclusion in the booklet is coming in to the AIBS office.

Dr. William R. Duryee, Chairman of the Committee on Publications, reported discussions that have taken place on plans to develop the Rapid Selector. The procedure mentioned in our January editorial is now regarded as the second step, instead of the first, and a less costly and more limited project is being planned for the preparation of coded film for trial in the selector. It has become clearer how to develop the machine itself to the point of practical utility.

Dr. Hiden T. Cox, Deputy Executive Director of AIBS, reported on the work for which he is particularly responsible: namely, service to the scientific advisory committees of the Division of Biological Sciences, Office of Naval Research; preparation of a register of biologists for the National Science Foundation; and operation of a Placement Service for biologists. About the last, a word might be said at this time. The Placement Service is now partially supported by fees from those who use it and it is known to have been effective in a number of instances. Naturally, members of AIBS (i.e., members of member societies) pay less than non-members for the listing of their biographical sketches in the placement booklet. It was pointed out that the higher charge to non-members works undue hardship upon young zoologists who are ready for employment but are not eligible for membership in the American Society of Zoologists. Hereafter, these young people can be listed at the lowest rate, if sponsored by a member of the Society.

The editor, also, reported to the Executive Committee. The essence of what he had to say is to be found in "El Dorado," page 10, to which your attention is again invited.

CALL FOR PAPERS

Florida Meetings

Each society meeting with the AIBS at Gainesville is in the process of contacting their membership about papers (and abstracts) to be presented in September. All program material should reach the Local Representative in Florida ***not later than June 1st.*** The AIBS will then receive the material by June 15th. A sample paper title appears below.

EINSET, JOHN and CHARLOTTE PRATT, New York Agricultural Experiment Station, Geneva, N. Y. Hybrids Between Blackberries and Red Raspberries. (Illustrated, 2 x 2)

From the Societies

• **The sixth autumn meeting of the American Physiological Society** will be held on the campus of the University of Wisconsin, September 8-10, 1954. Registration and scientific sessions will open Wednesday, September 8. A banquet will be held on Thursday evening, September 9. Detailed information and instructions concerning submission of abstracts will be mailed to members at a later date. The deadline for receipt of abstracts is July 15. For additional information, write: Dr. W. B. Youmans, Department of Physiology, Service Memorial Institutes, University of Wisconsin, Madison 6, Wisconsin.

• **The annual meeting of the American Dairy Science Association** will be held at Pennsylvania State University, June 22-24, 1954. Attendance is expected to be about 1,200. General Chairman of the meeting is Dr. F. J. Doan, Department of Dairy Husbandry, Pennsylvania State University. All inquiries relative to the meeting should be directed to Dr. Doan or to the Secretary of ADSA, Dr. P. R. Ellsworth, Ohio State University, Columbus 10, Ohio.

• **The following foresters have been elected to the grade of Fellow in the Society of American Foresters:** William T. Cox, St. Paul, Minn.; George L. Drake, Shelton, Wash.; James C. Evenden, Coeur d'Alene, Idaho; George A. Garratt, New Haven, Conn.; Leo A. Isaac, Portland, Ore.; Joseph Kittredge, Berkeley, Calif.; Richard E. McArdle, Washington, D. C.; Woodbridge Metcalf, Berkeley, Calif.; and Ernest A. Sterling, Montrose, Pa.

• **The Central States Section of the Botanical Society of America** will hold its annual foray June 15-19, 1954 in the Arkansas Ozarks. Members will assemble at the State University of Fayetteville on June 15. The tour will start from there the next morning and will take in certain areas of the Ozarks, Ouachitas, Hot Springs National Park, and according to the interests of the groups, sphagnum bogs, cypress swamps, prairies, and limestone glades. Further information may be obtained from Dr. Hugh Iltis, Local Chairman, University of Arkansas, Fayetteville, or from the Secretary-Treasurer, Dr. L. J. Gier, William Jewell College, Liberty, Mo.

• **The 1954 annual meeting of the American Society of Parasitologists** will be held in conjunction with the American Society of Tropical Medicine and Hygiene at Memphis, Tennessee on November 4-6, 1954. Dr. Don Eyles and Dr. A. V. Hunninen are in charge of local arrangements.

• **The annual meeting of the Radiation Research Society** will be held at Cleveland, Ohio, on May 17-19, 1954. The sessions will be held at the Wade Park Manor Hotel and at Western Reserve University. In addition to submitted papers, a symposium on "The Role of Nuclear Damage in Radiation Induced Cell Injury and Death" will be held, as well as several invited papers in radiation physics and chemistry. Those desiring to report original research in radiation effects, interested in attending, or desiring additional information, may contact the Secretary of the Society, Dr. A. Edelmann, Brookhaven National Laboratory, Upton, Long Island, N. Y.

• **Officers of the American Society of Plant Physiologists, Western Section,** for 1954 are: Chairman, Harlan K. Pratt; Vice-Chairman, Samuel G. Wildman; Secretary-Treasurer, D. J. Wort. The Western Section of the ASPP plans to participate in the Pacific Division, AAAS meetings in Pullman, Washington, June 22-24, 1954. In addition to the presentation of papers during the two days, two symposia are on the program.

• Seventy-two members of the National Conservation Committee of the National Association of Biology Teachers, recently participated in a three-day conference as a part of the annual meetings of the AAAS. The State and Regional Chairmen of the Project assisted by ten members of an Advisory Committee and the Executive Committee edited a 360-page manuscript which will be printed in 1954 as a ***Handbook on Teaching Conservation and Resource-use Education.*** The Handbook will contain over 150 descriptions of conservation projects or programs from 30 states, submitted by teachers through the members of the National Conservation Committee. The Handbook will be published by the Interstate Press, Danville, Illinois. The Conservation Project has been underwritten for the first three years by a $10,000 grant-in-aid from the American Nature Association.

The National Committee decided at its annual meeting to continue as a permanent Project and Committee of the NABT, so as to implement many of the projects currently sponsored and to expand the program in the areas of teacher training and state cooperation. Additional descriptions of outstanding school programs will be solicited and published in the journals sponsored by the many national organizations with representatives on the Advisory Committee.

A new project to be co-sponsored with the U. S. Soil Conservation under the direction of Bert D. Robinson will be the publication of an annual summary of all workshops in Conservation Education.

Additional information about the Conservation Project and publications currently available may be obtained from: Dr. Richard L. Weaver, P. O. Box 2073, Ann Arbor, Michigan.

• **The fifty-fourth general meeting of the Society of American Bacteriologists** will be held May 2-7, 1954 at the William Penn Hotel, Pittsburgh, Pennsylvania. F. S. Cheever is Chairman of the Local Committee on arrangements and all requests for further information should be addressed to the General Committee for the 1954 SAB Convention, P. O. Box 1912, Pittsburgh 30, Pa. Reservations may be made directly with the William Penn Hotel.

• **The Western Section of the Ecological Society of America** will hold its annual summer meeting at Pullman, Washington, June 21-25, 1954. Titles and brief abstracts of papers to be presented should be sent to the Secretary of the Western Section, Dr. John W. Marr, Department of Biology, University of Colorado at Boulder, on or before April 25.

• **Association of Southeastern Biologists, 1953-54 officers.**
President: B. D. Reynolds
Pres.-Elect: H. R. Totten
Vice-President: A. V. Beattie
Treasurer: J. P. Reynolds
Secretary: Mary E. Gaulden, Oak Ridge National Laboratory, Oak Ridge, Tenn.

• **Society for the Study of Evolution, 1953-54 officers.**
President: Karl P. Schmidt
Vice-Presidents: Theo. Just, Lee R. Dice, C. G. Aguayo
Secretary: Harlan Lewis, Botany Dept., University of California, Los Angeles 24, Calif.

• The series of articles, **"Training the Conservation Worker,"** published in the January *Bulletin*, has been reprinted by the National Association of Biology Teachers as part of their Conservation Project. The seven-page leaflet may be purchased, for 10¢ a copy (20% discount on orders of 100 or more), from Richard L. Weaver, P.O. Box 2073, Ann Arbor, Michigan.

The A.I.B.S. Reports

• ***The Directory to Hydrobiological Laboratories and Personnel in North America,*** prepared by the Hydrobiology Committee (AIBS Advisory Committee to the Office of Naval Research), will be published by the University of Hawaii Press, Honolulu, T. H., about May 1st, 1954 and will cost $3.75. The volume is cloth bound and will contain 322 pages, 2 maps, 4 tables, and informational data on 187 laboratories and 1,300 hydrobiologists.

❖

• **The National Association of Biology Teachers** voted during a recent meeting to become a full member of the AIBS. This society brings into the activities of the Institute some 2,400 secondary school and college teachers. The NABT was organized in 1938 and its first officers were: President, M. C. Lichtenwalter; Secretary-Treasurer, P. K. Houdek; Acting Editor-in-Chief, I. A. Herskowitz. Officers for the year 1954 are: President, Arthur J. Baker, Crystal Lake High School, Crystal Lake, Ill.; Secretary-Treasurer, John P. Harrold, 110 Hines Street, Midland, Michigan. The Association publishes a journal, *The American Biology Teacher*, edited by B. Bernarr Vance.

❖

• **An Advisory Committee in Physiological Psychology to the Office of Naval Research** has been organized as the fifth such committee under the auspices of the American Institute of Biological Sciences. Dr. W. J. Brogden of the University of Wisconsin is Chairman of this Committee. Other members are: Clarence Graham, Columbia University; D. O. Hebb, McGill University; Wilden A. Munson, Bell Telephone Laboratories, Inc.; and Carl Pfaffmann, Brown University. The first meeting of the Committee was held at the Harvard Psycho-Acoustic Laboratory, Cambridge, Massachusetts, on December 4 & 5, 1953.

At present the Physiological Psychology Branch of ONR supervises 52 contracts at 32 universities in 21 states.

❖

• **The June list of registrants in the AIBS Placement Service** is in preparation. Any biologist who wishes to appear on this list must complete application forms and return them to the AIBS office by *May 10th*. Members of Member Societies may register with the payment of a $2.00 fee (per listing); members of Affiliate Societies are required to pay a fee of $5.00 (per listing); and all non-members are charged $10.00 (per listing). Employers interested in the list may obtain it from the AIBS office for $1.00. For further information or registration blanks write: Placement Service, American Institute of Biological Sciences, 2101 Constitution Avenue, Washington 25, D. C.

❖

• **Guest editorials,** by prominent biologists, that have appeared in the *Bulletin* during recent months, may be purchased in quantity from the AIBS office for 5¢ each, $3.00 per hundred.

❖

• **The Institute of Laboratory Animal Resources** was organized in 1953 within the structure of the AIBS to meet an increasing need for adequate standards and methods in the procurement of biological materials for research, assaying, testing and teaching. Among the first tasks of a program of this kind was that of surveying the uses, needs and supply of the various kinds of animals used in such work. The preliminary survey, which is now being analyzed and assembled for publication and distribution, shows that much remains to be done in organizing the field of animal supply and use. One outstanding fact seems to be that most producers have only a vague idea of the specific purposes for which their animals are being used. Many of the users are unaware of the importance of recording or reporting in publications the source of strains of animals used in various tests and procedures, in order that more accurate data may be gathered concerning the behavior of different animal stocks under certain experimental treatments.

While the first attempt at compiling the data will be deficient in many respects, it is hoped that this very lack of information will stimulate both producer and user to greater effort in accumulating such information for the future. It is planned to include a listing of the users and producers of laboratory animal stocks together with information on the volume and availability of the animals used. In addition, data on breeding systems used, genetic characteristics, nutrition, and health and disease history of the animals will be included as far as such information has been obtained. Also brief statements describing the most prevalent diseases of laboratory animals and the usual treatment, as well as one or two references with more detailed information on disease prevention and control, will be included. Diets which have been found satisfactory and practical for several various species of animals will be given. References on animal care, management and other material of use to animal producers and users will be given. The **handbook** in which the above material will appear is due about July 1st. The survey will be continued, however, to complete the information and obtain a wider coverage of animal producers and users. New issues or supplements to the handbook will appear from time to time. Because of its incomplete character, circulation of this first issue will be largely limited to those who have cooperated in furnishing the data.

The Biology Library

One copy of each publication submitted for listing should be sent to the Editor, The AIBS Bulletin, 2101 Constitution Avenue, Washington, D. C. Only books published within a year of receipt will be reviewed. Older books will be listed.

ANIMAL SCIENCES

A Contribution to the Taxonomy and Distribution of the American Freshwater Calanoid Crustacea. TREVOR KINCAID. 74 pages, 5 plates. The Calliostoma Company, 1904 East 52nd Street, Seattle, Washington. (1953) $1.50

In this small, paper-bound treatise the author, who is Professor of Zoology at the University of Washington, writes about the material he has collected throughout the State. Published material on these crustacea is meagre and this book was designed to "throw some light upon the systematic status and geographic distribution of the fresh-water copepods indigenous to the State of Washington and contiguous areas, including Alaska." Some material from other areas of North America has been included when it was thought to be of interest.

Tissue Culture. E. N. WILLMER. 175 pages, 2 plates, 8 diagrams. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. (Second edition, 1954) $2.25

Originally published in 1935, the present edition attempts to bring up-to-date the position of tissue culture in the study of growth and differentiation. The two decades between have

seen the development of the phase-contrast microscope, the electron microscope and the reflecting microscope, the application of tracer elements in biological problems, and new methods of microanalysis and histo-chemistry. The effect of these advances on the field of tissue culture is reviewed without altering the general approach, which is still essentially from the angle of general physiology. The book is one of the Methuen Monographs on Biological Subjects.

❖

Intertidal Invertebrates of the Central California Coast. S. F. Light, revised by R. I. Smith, F. A. Pitelka, D. P. Abbott and F. M. Weesner. 466 pages, illustrated. University of California Press, Berkeley 4, California. (1954) $5.00

The classic text, upon which this revision was built, was published by S. F. Light in 1941. At the time of his death in 1947, the first edition was practically out of print. Twenty-two zoologists contributed to the revised version, which is neither a textbook nor a monograph but rather a working guide for marine life along the Pacific Coast. Among the revisers, R. I. Smith, F. A. Pitelka, and F. M. Weesner are faculty members of the Zoology Department, University of California, and D. P. Abbott is Assistant Professor of Zoology at Stanford University. Contributors of some specialized chapters are: W. D. Harman, Joel W. Hedgpeth, C. H. Hand, Libbie H. Hyman, Rolf Bolin, and Olga Hartman. Illustrations are black and white line drawings; keys, many original, to most species of West Coast invertebrates are included.

❖

Sex Determination. F. A. E. Crew. 68 pages. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. (1954) $1.50

A Methuen publication by the Professor of Social Medicine, University of Edinburgh, this little volume presents the salient facts relating to sex determination. The author says of his text, "It presupposes that the reader already has a fair knowledge of genetics and cytology; it restricts itself to a consideration of the cytological and genetical aspects of sex-determination and does not consider the problems that cluster round the actual development of the sexual characters, since such development pertains not to sex-determination but rather to sex differentiation."

❖

Sexual Behavior in the Human Female. Alfred C. Kinsey, W. B. Pomeroy, C. E. Martin and P. H. Gebhard. 842 pages, 155 figures. W. B. Saunders Company, West Washington Square, Philadelphia, Pa. (1953) $8.00

So much has been written, in popular magazines and the national press, about the subject of this book, that small purpose would be served to add to this volume of words. It is suggested that all biologists find time to read the book and draw their own conclusions.

PLANT SCIENCES

Plant Genera, Their Nature and Definition. G. H. M. Lawrence, I. W. Bailey, Arthur J. Eames, Reed C. Rollins, Marion S. Cave and Herbert L. Mason. 162 pages, tables and figures. Published as No. 3 of Vol. 14 of Chronica Botanica. The Chronica Botanica Company, Waltham, Mass. and Steckert-Hafner, Inc., New York, N. Y. (1953) $2.00

This is the report of a symposium organized by the American Society of Plant Taxonomists and the Botanical Society of America during the 1952 AIBS meetings at Cornell University. In addition to the papers presented by the participants in the symposium there is a foreword by Frans Verdoorn and an introductory essay on "Generic Synopses and Modern Taxonomy" by Theodor Just. A number of facsimile pages from early generic floras complete the volume.

Vegetable and Flower Seed Production. Leslie R. Hawthorn and Leonard H. Pollard. 626 pages, 70 figures, 17 tables. The Blakiston Company, Inc., 575 Madison Avenue, New York 22, N. Y. (1954) $7.50

The authors consider this to be the first textbook in the specific field of vegetable- and flower-seed production. In it they have attempted to present the essential principles of seed production combined with a practical discussion of the actual methods used by seed growers. Part I is a general discussion of the organization and history of the vegetable- and flower-seed industry. Parts II and III describe methods of growing vegetable and flower seeds. Part IV considers the handling of matured seed—threshing and processing of seed and equipment used by seedsmen in this phase of their business. This book should be of interest not only to instructors in horticulture but to seedsmen, county agents and seed company fieldmen as well.

❖

Taxonomic Terminology of the Higher Plants. H. I. Featherly. 166 pages. The Iowa State College Press, Ames, Iowa. (1954) $3.75

Essentially a glossary of taxonomic terminology this little volume should be a valuable tool to students in plant taxonomy, plant distribution and speciation. The first half is given over to a glossary of technical terms which is certainly ample if not exhaustive. In the second part these terms are arranged according to subject classification so that, for example, those terms specifically applicable to stamens, or habitat, or inflorescence may be determined. A section on Greek and Latin components of scientific words is included.

❖

Diseases of British Grasses and Herbage Legumes. Kathleen Sampson and J. H. Western. 118 pages, 9 plates, 19 text figures. Cambridge University Press, 32 E. 57th Street, New York 22, N. Y. (Second edition, 1954) $3.00

This is the second edition of a standard reference work on diseases of British grasses which first was published in 1941. In this revision the authors present a comprehensive survey of the diseases of this group of plants as they occur in Britain today as well as a discussion of those developments in other countries likely to be of importance to British agriculture in the future. Much of the text has been rewritten and nomenclature of the disease organisms has been revised to conform to accepted current usage. The bibliography has been enlarged considerably.

❖

Pioneer Plant Geography. W. B. Turrill. 267 pages, 21 plates. Martinus Nijhoff, The Hague. (American Distributor: The Chronica Botanica Company, Waltham 54, Mass.) (1953) 19 guilders.

Beyond question one of the great pioneers of plant geographical studies was Joseph Dalton Hooker. He wrote prolifically of his botanical explorations in North Africa, India, the Middle East, Australasia, North America and southern South America. Many of his publications are considered classics of plant geographical literature. However, much of his work probably has not received due recognition because it was included in what were mainly taxonomic works or books of travel. Dr. Turrill has attempted to glean the major contributions of Hooker to the study of plant distribution. He then evaluates these contributions in the light of the subsequent work of many botanists. Every plant geographer or taxonomist will find a place in his library for this scholarly work.

❖

Manual of the Plants of Colorado. H. D. Harrington. 666 pages. Alan Swallow, Publisher, 2679 South York Street, Denver 10, Colorado. (1954) $8.00

This conservative treatment of the vascular flora of Colorado will be of particular value to botanists in the Rocky Mountain

Region. The sequence of families generally follows the sequence of Engler and Prantl. No new species are proposed and new combinations are kept to a minimum. The author estimates that about one out of every thirty listed species is a new record for Colorado. A brief introduction to the vegetation zones of the state is included.

❖

The Macmillan Wild Flower Book. Text by CLARENCE J. HYLANDER. Illustrations by EDITH FARRINGTON JOHNSTON. 480 pages, 232 colored plates. The Macmillan Company, 60 Fifth Avenue, New York 11, N. Y. (1954) $15.00

A definite contribution to a naturalist's library, this large volume has been twelve years in production. In 1941 an authoritative list of wild flowers was prepared with the assistance of the Curator of a Botanical Garden. Over 500 flowers were chosen and the artist began to collect and paint. Mrs. Johnston painted (in watercolors) each plate from actual specimens and often, to maintain accuracy, had to travel considerable distances or have samples shipped to her by air. Over a period of years a final set of 232 color plates showing 426 flowers, accumulated. Dr. Hylander's descriptive notes were written with the artist's pictures at hand so every detail of text and illustration would agree. The nomenclature of "Gray's Manual of Botany" was used. The text has been placed as closely as possible to the related pages of prints. The only dislocation occurs on the compound plates where the artist did not depict flowers from the same genus or family on the same plate. That the book might be published at a reasonable price and the desired color quality obtained, the lithographing was done in Europe—with both the original paintings and the exact inks flown over. The book shows the thought, skill and patience that went into its production and it should assume a place immediately among the important flower books that have been published.

MISCELLANEOUS

An Introduction to Laboratory Technique in Bacteriology. MAX LEVINE. 413 pages. The Macmillan Company, 60 Fifth Avenue, New York 11, N. Y. (Third edition, 1954) $4.50

In this third edition the basic exercises have been "rearranged into eight categories—(1) methods of sterilization (2) staining techniques for determination of morphology (3) preparation of culture media (4) the cultural characteristics of microorganisms (5) procedures for detection of enzymatic action—physiological or biochemical properties—of bacteria (6) effects of environmental factors (physical and chemical) on microorganisms (7) quantitative estimation of bacteria and (8) the phenomenon of agglutination and techniques for its detection." The nomenclature conforms to the last edition (1948) of Bergey's Manual of Determinative Bacteriology.

❖

The Biochemistry of the Nucleic Acids. J. N. DAVIDSON. 200 pages. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. (Second edition, 1953) $2.25

The author is Gardiner Professor of Physiological Chemistry at the University of Glasgow and his book is one in the series of Methuen Monographs in Biochemical Subjects. The author's intention is to "provide an elementary outline of the main features of the nucleic acids and nucleoproteins for the benefit of students of biochemistry, of chemists who wish to know something about the biological aspects of the subject, and of biologists who wish to learn a little about the chemical aspects." Each chapter is provided with "a small though carefully selected list of references to reviews, and important original papers." The book is illustrated with photographs, tables and skeletal diagrams of compounds.

Cell Chemistry. Edited by DEAN BURK. 362 pages. The Elsevier Press, 402 Lovett Boulevard, Houston, Texas. (1953) $7.50

The original edition of this book appeared as an issue of *Biochemica et Biophysica Acta* in 1953. It is a collection of 36 papers dedicated to Otto Warburg on the occasion of his 70th birthday. Several manuscripts remain in their original French or German and each paper is followed by a résumé in English, French and German. Dean Burk, Head of the Cytochemistry Section, National Institutes of Health, edited the volume and introduced the contributions with a biographical essay, "Otto Warburg, Artisan of Cell Chemistry."

❖

Cold Spring Harbor Symposia on Quantitative Biology. Volume XVIII. Viruses. 301 pages, 97 figures and 15 plates. The Biological Laboratory, Cold Spring Harbor, Long Island, New York. (1953) $8.00

This symposium, held June 5-11, 1953, was attended by two hundred and seventy-two scientists. The Director of the Laboratory, M. Demerec, writes in his foreword: "The first paper on the subject of viruses to be included in the Cold Spring Harbor Symposia was given at the sixth Symposium, in 1938, by W. M. Stanley and H. S. Loring. Since that time papers on this topic have been presented at several other sessions, where the main problems under consideration related to genetic mechanisms. This year's Symposium was the first to be devoted entirely to discussion of the fundamental aspects of virus research." Thirty-nine papers are included in the volume under headings: Virus in the Vegetative State and Its Maturation; Provirus; The Transition from Provirus to Vegetative Virus; The Transition from the Infective to the Vegetative State; Structure of Viruses; Biochemical Studies of Virus Infections; Host-Controlled Variations of Viruses; and Viruses in Tissue Culture.

❖

Information Theory in Biology. Edited by HENRY QUASTLER. 273 pages. University of Illinois Press, Urbana, Illinois. (1953) $4.00

Norbert Wiener in his *Cybernetics* and E. Schroedinger in *What is Life?* first alluded to the advantages of analyzing basic functions such as metabolism, growth, and differentiation. In the present volume the formalism of information theory and cybernetics has been applied to some basic biological problems, with some degree of success. The editors and authors believe that these theories should ultimately contribute to the understanding of the nature of biological control systems. The papers presented are "of a very different degree of maturity. They range from authoritative reviews of well-known facts to hesitant and tentative formulations of embryonic ideas." The collection is largely exploratory and the editors state that the stage has not been reached in biological application where it would be "fruitful to add experimental studies to the theoretic considerations. Nevertheless, we do feel that ground has been broken, that possibilities of research have been opened."

❖

The Effect of ACTH and Cortisone upon Infection and Resistance. Edited by GREGORY SHWARTZMAN. 204 pages. Columbia University Press, 2960 Broadway, New York 27, N. Y. (1953) $5.50

This volume is composed of the papers presented at Symposium VI of the Section on Microbiology of the New York Academy of Medicine. The topics include: Some General Considerations Concerning the Role of the Adrenal Cortex in Intermediary Metabolism; The Influence of Adrenalectomy and Cortisone Treatment on Certain Enzymatic Reactions in the Rat; The Effect of Corticosteroids upon Lymphoid Tissue; The Effect of Cortisone upon Repair Processes in Dense and Loose Connective Tissue; Adrenal Hormones and the Development of Antibody and Hypersensitivity; Depression by Cortisone of Inherited and Acquired Resistance to Infection and to Tumor

Grafting; Constitutional Factors in Resistance to Infection—The Effect of Cortisone on the Pathogenesis of Tuberculosis; Studies on the Mechanism of Action of Cortisone in Experimental Syphilis; The Effect of Cortisone in Activating Latent Trypanosomiasis in Rhesus Monkeys; The Effect of ACTH and Cortisone upon Allergic Diseases; The Effects of Cortisone on Bacterial Infection and Intoxication; Observations on Adrenal Cortical Hormones in Pneumococcal and Influenza Viral Infections and in Malaria; Alteration of Experimental Poliomyelitis by means of Cortisone with Reference to Other Viruses.

❖

The Mechanism of Enzyme Action. Edited by Wm. D. McElroy and Bentley Glass. 819 pages. The Johns Hopkins Press, Baltimore 18, Maryland. (1954) $11.00

This volume consists of the papers and discussions presented at a Symposium on the Mechanism of Enzyme Action, held at the Johns Hopkins University, under the sponsorship of the McCollum-Pratt Institute, on June 16-19, 1953. Dr. McElroy, Director of the Institute, writes in his preface: "During the past thirty years remarkable progress has been made in the isolation and identification of intermediates, necessary enzymes and coenzymes of a large number of biochemical reactions. The availability of isotopes and large quantities of purified enzyme has made it feasible to study in some detail the mechanisms involved in these processes. In recent years such studies have led to the idea that some enzymes enter as reactants, functioning to preserve bond energy. Contributions to the present symposium from the physical chemists, organic chemists, protein chemists, and enzymologists further emphasize the importance of the catalytic protein as a reactant in biochemical transformations."

❖

The Harvey Lectures. Series XLVIII. 273 pages. Academic Press Inc., 125 East 23rd Street, New York 10, N. Y. (1954) $7.50

The 1952-53 series of lectures delivered under the auspices of the Harvey Society of New York includes: "The Hormonal Control of Plant Growth," by James Bonner; "Experiments on Chemical Alteration of Virus Infections," by Frank L. Horsfall, Jr.; "Biological Synthesis of Cholesterol," by Konrad Bloch; "Congenital Malformations Induced by Maternal Dietary Deficiency," by Josef Warkany; "The Functions of the Lung," by Julius H. Comroe, Jr.; "Glycogen Structure and Enzyme Deficiencies in Glycogen Storage Disease," by Gerty T. Cori; "Mechanisms for Stabilizing the Alkaline Reserves of the Body," by Robert F. Pitts; and "Acetyle Coenzyme A and the Fatty Acid Cycle," by Feodor Lynen.

❖

Biological Conservation. John D. Black. 328 pages, illustrated. The Blakiston Company, Inc., 575 Madison Avenue, New York 22, N. Y. (1954) $5.00

The author states, "This book is not written as a guide for the expert or the professional wildlife man, but for the beginner." Dr. Black, who is Professor of Zoology at the Missouri Teachers College in Kirksville, attempts to build a background of information concerning renewable resources such as soil, water, grasslands, and forests, and to present an introductory study of the problems of wildlife conservation. Two particularly interesting features of the book are to be found in the Appendices. The outstanding books in the field of conservation and related areas are listed with short annotations highlighting the reasons for the texts' importance. In Appendix B the author offers a directory of useful educational films related to wildlife, which he hopes will be used as a guide by those who wish to make the best use of visual-aids.

Main Currents of Scientific Thought—A History of the Sciences. S. F. Mason. 520 pages. Abelard-Schuman, New York, N. Y. (1953) $5.00

The increase in the complexity of science carries with it the necessity for a greater degree of self-awareness. This is made evident now by the greater attention being given to studies on the history and philosophy of science as reflected in the many new books appearing on these subjects.

This book by an English historian of science provides a useful introduction to the development of scientific thought from antiquity to modern times. The text consists of six parts subdivided into 48 chapters. Part one deals with ancient science from the Egyptians and Babylonians to its decline in Rome. Part two takes up science in the Orient (China, India and Islam) and in medieval Europe. The chapters on China and India though brief are provocative and suggestive of the need for further research. In part three the author discusses the scientific revolution of the 16th and 17th centuries and in the succeeding parts he reviews the progress of science in the 18th and 19th centuries. Lastly a glimpse of 20th century science is provided including chapters on modern biology, some aspects of American and Soviet Science, and a concluding chapter on science and history.

Biologists should find this a helpful book in that it provides a general background against which to view the history of their own specialties. Although there are no illustrations, there is a bibliography and an index.

❖

Preparation for Medical Education in the Liberal Arts College. Aura Edward Severinghaus, Harry J. Carman and William E. Cadbury, Jr. 400 pages. McGraw-Hill Book Company, Inc., 330 W. 42nd Street, New York 36, N. Y. (1953) $4.50

This is the published report of the Subcommittee on Professional Education of the Survey of Medical Education of which Dr. Severinghaus is Chairman, Dr. Carman is Director of Study, and Dr. Cadbury is Associate Director. Over 100 liberal arts colleges collaborated with the subcommittee in the survey of liberal arts education and its relation to the preprofessional student. The basic assumption is made that it is undesirable to distinguish between the preprofessional student and other liberal arts students. Such topics as the value of a balanced education to a pre-medical student; the major academic disciplines and their relation to specialized medical disciplines, the teacher and his methods, and the responsibilities of the pre-medical student in a liberal arts college are discussed.

❖

Biology. Paul B. Weisz. 679 pages, illustrated. McGraw-Hill Book Company, Inc., 330 W. 42nd Street, New York 36, N. Y. (1954) $6.50

This copiously illustrated and interestingly organized text deserves the attention of all general biology instructors. The entire field of biology is developed within a framework of 4 basic concepts: environment, living substance, metabolism, and self-perpetuation. In each category Dr. Weisz organizes his material in progressing stages of complexity. Thus a chapter-section on the first level becomes an entire chapter on the second level, and a whole group of chapters on the next level. Diagrams and photomicrographs are used effectively throughout the text.

❖

The Mind and the Eye. Agnes Arber. 146 pages. Cambridge University Press, 32 East 57th Street, New York 22, N. Y. (1954) $3.00

Mrs. Arber, a noted British botanist, has spent a considerable part of her professional career examining the nature of scientific thought and processes and relating these to the broader fields of general knowledge and philosophy. Part I of this interesting little book deals with "The Nature of Biological

Research" under such chapter headings as: The Biologist and His Problem, The Mode of Discovery in Biology, The Logical Background of the Biologist's Problem, The Biologist's Use of Analogy, and The Biologist and the Written Word. In Part II, where the more general subject is "The Bases of Biological Thinking," the author discusses: Biology and Truth, The Basic Assumptions of Biology, Biological Antitheses, Antitheses and Dialectic, and a concluding chapter which relates what the eye sees and what the mind does with it, called The Mind and the Eye.

❖

Streptococcal Infections. Edited by MACLYN MCCARTY. 218 pages. Columbia University Press, 2960 Broadway, New York 27, N. Y. (1954) $5.00

These papers, read at the Seventh Symposium of the New York Academy of Medicine in February 1953, review the biology of streptococci and their relation to diseases of man. The chemistry and biology of the hemolytic streptococci, particularly Group A, precede a discussion of the interrelation between the organisms and the host. The clinical aspects of streptococcal disease occupy the attention of some of the speakers and the concluding papers in the symposium discuss the sequelae which follow in the wake of these infections. There are a total of fifteen papers in the group and the authors are: R. C. Lancefield, A. W. Bernheimer, L. R. Christensen, S. D. Elliott, H. D. Slade, W. C. Schmidt, D. W. Watson, W. S. Tillett, J. H. Dingle, M. McCarty, H. S. Lawrence, L. W. Wannamaker, F. W. Denny, Jr., C. H. Rammelkamp, Jr., and C. A. Statson, Jr.

❖

Elements of Statistics. H. C. FRYER. 262 pages. John Wiley & Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. (1954) $4.75

Co-author of many publications on the application of probability and statistics to the fields of biology and engineering, Dr. Fryer, of Kansas State College, brings twenty years of teaching experience to the writing of this book. It is designed for the reader encountering statistics for the first time—either as a newcomer to the subject, or as a worker in one of the fields which draws on statistics as a research tool. Not only are statistical methods, ideas and analytical thinking offered to the former but introductory material in probability, significance and the use of confidence intervals is supplied for the latter. A chapter of review problems at the end of the book will serve to refresh the more experienced reader.

❖

Dictionary of Organic Compounds. 4 volumes. Edited by IAN HEILBRON. 3031 pages. Oxford University Press, 114 Fifth Avenue, New York 11, N. Y. (Second edition, 1953) $78.00

The revised edition of this tremendous four-volume set, occupying a full seven inches of shelf space, would be a valuable addition to the laboratory of any chemist, especially any biochemist. When the original Dictionary was first published in 1934-37, it was intended that the content should be revised every five or six years. This revision was begun but was interrupted by World War II. However, in view of the tremendous upsurge of research and the extensive production of new compounds that followed the war, a complete revision was decided upon. Over 2,500 compounds appear as principal entries for the first time now, while "some thousands of additions or amendments have been made to existing entries following upon the publication of fuller or more accurate data and information." Many superfluous constitutional formulae were deleted but the necessary material was found to occupy four instead of the original three volumes. Otherwise the format and general structure remain the same as in the first edition.

LABORATORY MANUALS

Laboratory Studies in Biology. ADDISON E. LEE and OSMOND P. BRELAND. 253 pages, perforated pages, illustrated. Harper & Brothers Publishers, 49 East 33rd Street, New York, N. Y. (1954) $3.50

Private Bibliographies

This listing of private collections was begun in the January 1954 *Bulletin* and will be continued in the July issue.

ANIMAL SCIENCES

45. TRANSPLANTABLE TUMORS. George D. Snell, Jackson Memorial Laboratory, Bar Harbor, Maine. Period: before 1929. Approx. 1,100 references. Selective. Not geographically limited. Partially annotated. May be seen.

46. ZOOLOGY AND ZOOLOGICAL ECOLOGY OF TENNESSEE AND THE TENNESSEE VALLEY REGION. C. S. Shoup, Biology Branch, Research and Medicine Division, U. S. Atomic Energy Commission, Room 486, AEC Administration Building, Oak Ridge, Tennessee. Period: 1815-1951. Approx. 2,000 references. Inclusive. Limited to Tennessee and the Tennessee Valley region. Annotated. May be seen.

47. TOXOPLASMA AND TOXOPLASMOSIS. Don E. Eyles and Jacob K. Frenkel. Public Health Service, Laboratory of Tropical Diseases, 874 Union Avenue, Memphis 3, Tenn. Period: to date. Approx. 1,000 references. Inclusive. Not geographically limited. Unannotated. May be seen. Published as Public Health Service Publication No. 247.

48. FILARIASIS. Colvin L. Gibson, Laboratory of Tropical Diseases, Public Health Service, 874 Union Avenue, Memphis 3, Tenn. Period: to date. Approx. 700 references. Selective. Not geographically limited. Partially annotated. May be seen.

49. FEULGEN NUCLEAL REACTION. Milton A. Lessler, Dept. of Physiology, Ohio State University, Columbus 10, Ohio. Period: 1924-1952. Approx. 300 references. Selective. Not geographically limited. Partially annotated. May be seen.

50. BACTERIAL POLYSACCHARIDES. William F. Windle, L. G. Ginger and I. E. Johnson, 6301 Lincoln, Morton Grove, Ill. (Baxter Laboratories, Inc.). Period: 1950 to date. Approx. 1,000 references. Selective. Not geographically limited. Annotated. Index has been published. May be seen.

51. WILDLIFE MANAGEMENT. Aldo Leopold and Joseph J. Hickey, Dept. of Wildlife Management, University of Wisconsin, Madison 6, Wis. Period: 1930 to date. Approx. 15,000 references. Selective. Limited to U. S. A., Canada and Alaska. Unannotated. May be seen.

52. POTASSIUM IN ANIMAL BIOLOGY. R. L. Zwemer, 5003 Battery Lane, Bethesda 14, Md. Period: 1890-1940. Approx. 3,600 references. Inclusive. Not geographically limited. Partially annotated. May be seen.

53. FISHERY BIOLOGY. Kenneth D. Carlander, Dept. of Zoology and Entomology, Iowa State College, Ames, Iowa. Period: 1930 to date. Approx. 14,000 references. Limited to North American freshwater. Unannotated. May be seen.

54. COLORADO ZOOLOGY. Richard G. Beidleman, Zoology Department, Colorado A & M College, Fort Collins, Colorado. Period: 1825 to date. Approx. 3,000 references. Inclusive. Limited to state of Colorado. Annotated. May be seen.

55. COLORADO ETHNOLOGY. Richard G. Beidleman, Zoology Department, Colorado A & M College, Fort Collins, Colorado. Period: 1540 to date. Approx. 500 references. Inclusive. Limited to Colorado. Annotated. May be seen.

56. BEAVER POND ECOLOGY. Arthur K. Adams, Jr., Institute of Fisheries Research, University Museums Annex, Ann Arbor, Mich. Period: 1868 to date. Approx. 1,200 references. Inclusive. Not geographically limited. Annotated. May be seen.

57. LEECHES (HIRUDINEA) OF NORTH AMERICA. Carl N. Shuster, Jr., Dept. of Zoology, Rutgers University, New Brunswick, N. J. Period: to date. Approx. 350 references. Emphasis on taxonomy and ecology. Limited to North America. Annotated. May be seen.

58. XIPHOSURA. Carl N. Shuster, Jr., Dept. of Zoology, Rutgers University, New Brunswick, N. J. Period: to date. Approx. 1,000 references. Inclusive. Not geographically limited. Partially annotated. May be seen.

59. MYA ARENARIA (SOFTSHELL CLAM). Carl N. Shuster, Jr., Dept. of Zoology, Rutgers University, New Brunswick, N. J. Period: to date. Approx. 260 references. Inclusive. Not geographically limited. Partially annotated. A bibliography in preparation.

60. AMPHIBIAN ANATOMY. Richard J. Baldauf, Dept. of Biology, Texas A & M College, College Station, Texas. Period: 1834 to date. Approx. 125 references. Selective for osteology. Not geographically limited. Partially annotated. May be seen.

61. LAMPREYS. Robert H. Shellhamer, Dept. of Anatomy, Medical Building, Indiana University, Bloomington, Ind. Period: 1945 to date. Approx. 900 references. Inclusive. Not geographically limited. Unannotated. May be seen.

62. MYRMECOLOGY. George C. Wheeler, Department of Biology, University of North Dakota, Grand Forks, N. Dak. Period: 1908 to date. Approx. 5,000 references. Inclusive. Not geographically limited. Unannotated. May be seen.

63. THE IMPACT OF EXOTIC ANIMALS ON A NATIVE FAUNA. Herbert W. Levi, University of Wisconsin, Extension Center, Wausau, Wis. Period: to date. Approx. 150 references. Not geographically limited. Unannotated. Mimeographed copies of bibliography available.

64. REPTILIAN AND AMPHIBIAN ENDOCRINOLOGY. Malcolm R. Miller, Dept. of Anatomy, Stanford University, Stanford, Calif. Period: 1900-1950. Approx. 500 references. Inclusive. Not geographically limited. Annotated. May be seen.

65. ADRENALINE, ADRENERGIC AND ADRENOLYTIC DRUGS. Fred R. Griffith, Jr., Dept. of Physiology, University of Buffalo, 4345 Main Street, Buffalo 14, N. Y. Period: 1895 to date. Approx. 15,000 references. Inclusive. Not geographically limited. Annotated. Indexed. May be seen.

66. PUBLISHED WORKS OF T. D. A. COCKERELL. William A. Weber, University of Colorado Museum, Boulder, Colorado. Period: 1880-1948. Approx. 4,000 references. Inclusive. Not geographically limited. Partially annotated. May be seen.

67. ORNITHOLOGY. T. C. Stephens, c/o Martin L. Grant, Dept. of Biology, Iowa State Teachers College, Cedar Falls, Iowa. Period: 1898-1947. Approx. 2,076 references. Inclusive. Limited to Iowa. Annotated. May be seen.

68. BEAVERS. Sidney K. Eastwood, Cornell University Library, Ithaca, N. Y. or Carnegie Library, Pittsburgh, Pa. Period: 1905-1943. Approx. 150 references. Selective for English papers. Not geographically limited. Unannotated. May NOT be seen.

69. BOOKS ON SEASHORE, OCEANOGRAPHY AND RELATED SUBJECTS. Joel W. Hedgpeth, Scripps Institution of Oceanography, La Jolla, California. Period: 1725 to date. Approx. 550 references. Selective. Not geographically limited. Partially annotated. Mimeographed bibliography in short supply. May be seen.

70. EVENING GROSBEAK (HESPERIPHONA CAPERTINA). Doris Huestis Speirs, "Cobble Hill," Altona Road North, R. R. 2, Pickering, Ont., Canada. Period: 1823-date. Approx. 12,000 references. Inclusive. Not geographically limited. Partially annotated. May be seen.

71. MEDICAL GENETICS. F. C. Fraser, Dept. of Genetics, McGill University, Montreal, Canada. Period: to date. Approx: 2,000 references. Selective for pediatrics. Not geographically limited. Partially annotated. May be seen.

72. APPLICATION OF RADIOACTIVE TRACERS TO BIOLOGICAL STUDIES. Glenn S. Rabideau, Div. of Biological and Medical Research, Argonne National Laboratory, P. O. Box 299, Lemont, Ill. Period: 1947 to date. Approx. 1,000 references. Inclusive. Not geographically limited. Unannotated. May be seen.

73. NUTRITION AND RELATED FIELDS. Marjorie Edman, 154 Animal Sciences Laboratory, University of Illinois, Urbana, Ill. Period: 1900 to date. Approx. 150,000 references. Selective. Not geographically limited. Annotated. May be seen.

74. MAMMALOGY. Murray L. Johnson, 501 North Tacoma Avenue, Tacoma 3, Washington. Approx. 580 references. Inclusive. Geographically limited to Pacific Northwest and Alaska. Unannotated. May be seen.

75. HERPETOLOGY. Murray L. Johnson, 501 North Tacoma Avenue, Tacoma 3, Washington. Approx. 270 references. Inclusive. Geographically limited to Pacific Northwest to Alaska. Unannotated. May be seen.

76. ICHTHYOFAUNA OF THE NORTH POLAR BASIN. Norman J. Wilimovsky, Natural History Museum, Stanford University, Stanford, California. Period: 1758 to date. Approx. 500 references. Inclusive. Limited to the Arctic region. Partially annotated. May be seen.

77. FISH FAUNA OF ALASKA. Norman J. Wilimovsky, Natural History Museum, Stanford University, Stanford, California. Period: 1758 to date. Approx. 100 references. Inclusive. Limited to Alaska. Annotated. May be seen.

78. RESISTANCE TO INSECTS IN PLANTS. Reginald H. Painter, Department of Entomology, Kansas State College, Manhattan, Kansas. Period: to date. Approx. 2,000 references. Inclusive. Not geographically limited. Partially annotated. May be seen.

79. FOSSIL BIRDS. Pierce Brodkorb, Department of Biology, University of Florida, Gainesville, Fla. Period: to date. Approx. 600 references. Inclusive. Not geographically limited. Annotated. May be seen.

80. MEXICAN ORNITHOLOGY. Pierce Brodkorb, Department of Biology, University of Florida, Gainesville, Fla. Period: to date. Inclusive. Limited to Mexico. Annotated. May be seen.

81. RADIOBIOLOGY. Roberts Rugh, College of Physicians and Surgeons, 630 West 168th Street, New York City. Period: 1940 to date. Approx. 16,000 references. Selective for radiation in biology. Not geographically limited. May be seen.

82. PROTOZOOLOGY (esp. GENUS TETRAHYMENA). John O. Corliss, Osborn Zoological Laboratory, Yale University, New Haven, Conn. Period: 1677 to date. Approx. 500 references. Inclusive. Not geographically limited. Partially annotated. May be seen.

83. ECOLOGY. CONSERVATION. THE CANIDAE. Adolph M. Stebler, Oklahoma Cooperative Wildlife Research Unit, 202 Life Science Building, Stillwater, Okla. Period: 1850 to date. Approx. 3,000 references. Inclusive. Mostly North American. The Canidae annotated. May be seen.

84. ARTHROPODS OF MEDICAL IMPORTANCE. Roger W. Williams, School of Public Health, Columbia University, 600 West 168th Street, New York 32, N. Y. Period: 1935 to present. Approx. 22,000 references. Selective. Not geographically limited. Unannotated. May be seen.

85. GENERAL BIOLOGY AND PUBLIC HEALTH ENGINEERING (Special reference to water pollution, aquatic invertebrates, aquatic herbicides, and fishes). Herbert W. Jackson, Environmental Health Center, 4676 Columbia Parkway, Cincinnati 26, Ohio. Period: 1930 to date. Approx. 2,000 references. Selective. Not geographically limited. Partially annotated. May be seen.

86. HIRUDINEA. Marvin C. Meyer, 23 Coburn Hall, Department of Zoology, University of Maine, Orono, Maine. Period: to date. Approx. 2,000 references. Inclusive. Not geographically limited. Partially annotated. May be seen.

87. MICRURGY. M. J. Kopac, Department of Biology, New York University, Washington Square East, New York 3, N. Y. Period: 1857 to date. Approx. 5,000 references. Inclusive. Not geographically limited. Partially annotated. May be seen.

88. ENTOMOLOGY (PSYCHODIDAE). William F. Rapp, Jr., 430 Ivey Avenue, Crete, Nebraska. Period: 1880 to date. Approx. 1,000 references. Inclusive. Worldwide. Partially annotated. May be seen.

89. ORNITHOLOGY OF NEBRASKA. William F. Rapp, Jr., 430 Ivey Avenue, Crete, Nebraska. Period: 1950 to date. Inclusive. Limited to Nebraska. Partially annotated. May be seen.

90. FAUNA OF NORTH DAKOTA. George C. Wheeler, Department of Biology, University of North Dakota, Grand Forks, N. Dak. Period: 1800 to date. Approx. 800 references. Inclusive. Limited to North Dakota. Unannotated. May be seen.

PLANT SCIENCES

36. PLANT VIRUSES. Helen Purdy Beale, Boyce Thompson Institute for Plant Research, Inc., 1086 North Broadway, Yonkers 3, N. Y. Period: to date. Approx. 12,000 references. Inclusive. Not geographically limited. Unannotated. May be seen.

37. PLANT CYTOLOGY, GENETICS AND EMBRYOLOGY. John L. Spencer, Dept. of Botany, University of Massachusetts, Amherst, Mass. Period: 1890 to date. Approx. 12,500 references. Inclusive. Not geographically limited. Partially annotated. May be seen.

38. CHARACEAE. Richard D. Wood, Dept. of Botany, University of Rhode Island, Kingston, R. I. Period: 1753 to date. Approx. 2,500 references. Inclusive. Not geographically limited. Annotated. May be seen.

39. TREE RINGS. PALEOCLIMATOLOGY. Waldo S. Glock, Macalester College, St. Paul 5, Minn. Period: to date. Approx. 10,000 references. Limited to English papers. May be seen.

40. VIRUS DISEASES OF PLANTS. C. M. Tompkins, Dept. of Plant Pathology, 107 Hilgard Hall, University of California, Berkeley, Calif. Period: to date. Approx. no. references: thousands. Inclusive. Not geographically limited. Unannotated. May be seen.

41. CITRUS CANKER. Kenneth W. Loucks, Citrus Experiment Station, Lake Alfred, Florida. Period. 1914-1932. Approx. 420 references. Inclusive. Not geographically limited. May be seen.

42. VEGETATION AND FLORA OF NEW JERSEY. Jack McCormick, Dept. of Botany, Rutgers University, New Brunswick, N. J. Period: 1772 to date. Approx. 800 references. Inclusive. Limited to North America (exclusive of Mexico). Annotated. May be seen. Expect to publish bibliography.

43. VEGETATION AND FLORA OF INDIANA. Jack McCormick, Dept. of Botany, Rutgers University, New Brunswick, N. J. Period: to date. Approx. 400 references. Inclusive. Limited to North America. Annotated. May be seen. Expect to publish bibliography.

44. PLANT PATHOLOGY. Father M. Claude, Dept. of Plant Pathology, Institut Agricole d'Oka, La Trappe, Quebec, Canada. Period: complete 1944 to date. Approx. 50,000 references. Inclusive. Limited to temperate zone plants. Unannotated. May be seen.

45. GINKGO BILOBA. Eric Christensen, Pennsylvania Avenue, Medford, N. Y. Period: 1700 to date. Approx. 180 references. Inclusive. Not geographically limited. Partially annotated. May be seen.

46. SOILS AND PLANT NUTRITION: SOIL ANALYSIS METHODS AND INTERPRETATIONS. Edwin Harrington, Carversville, Pennsylvania. Period: 1928 to date. Approx. 12,000 references. Generally selective. Limited to U. S. A. with emphasis on northeastern area. Partially annotated. May be seen.

47. PLANT ECOLOGY. WORLD PLANT GEOGRAPHY. Arthur G. Vestal, 211 Natural History Building, Urbana, Ill. Period: 1911 to date. Approx. 100,000 references. Inclusive. Not geographically limited. Partially annotated. May be seen.

48. PHYCOLOGY. G. W. Prescott, Dept. of Botany, Michigan State College, East Lansing, Michigan. Period: to date. Approx. 45,000 references. Inclusive generally. Not geographically limited. Unannotated. May be seen.

49. MENTHA SPICATA, M. CARDIACA, M. PIPERITA. George M. Hocking, School of Pharmacy, Alabama Polytechnic Institute, Auburn, Alabama. Period: to date. Approx. 1,650 references. Inclusive. Not geographically limited. Annotated. May be seen.

50. LIATRIS. George M. Hocking, School of Pharmacy, Alabama Polytechnic Institute, Auburn, Alabama. Approx. 300 references. Inclusive. Geographically limited to southeastern U. S. A. Annotated. May be seen.

51. IRIS. George M. Hocking, School of Pharmacy, Alabama Polytechnic Institute, Auburn, Alabama. Approx. 400 references. Inclusive. Geographically limited to southeastern U. S. A. Annotated. May be seen.

52. PAPAYA: PAPAIN. George M. Hocking, School of Pharmacy, Alabama Polytechnic Institute, Auburn, Alabama. Approx. 757 references. Inclusive. Not geographically limited. Annotated. May be seen.

53. PHARMACOGNOSY. George M. Hocking, School of Pharmacy, Alabama Polytechnic Institute, Auburn, Alabama. Approx. several thousand references. Inclusive. Not geographically limited. Annotated. May be seen.

(To be completed in the July 1954 *AIBS Bulletin*)

The Biological Sciences and the Fulbright Program

FRANCIS A. YOUNG

Executive Secretary, Committee on International Exchange of Persons
National Research Council, Washington, D. C.

THE entrance of the United States Government on a large scale into the field of international educational exchange was signalized in 1946 by the passage in Congress of Public Law 584, popularly known as the Fulbright Act.

This Act has been aptly described as "one of the most imaginative pieces of legislation of our times." It provides that foreign currencies, derived from the sale of surplus property overseas after World War II, may be used for the purpose of "financing studies, research, instruction and other educational activities of or for American citizens in schools and institutions of higher learning" abroad, and in assisting citizens of foreign countries in attending educational institutions in the United States. The proceeds from the sale of materials produced for waging war has thus been made available for the support of a program of educational interchange on an unprecedented scale, having as its primary aim the promotion of international understanding and world peace.

The administrative provisions of the Act are no less imaginative. Through the establishment of bi-national commissions abroad, which plan and administer the program overseas, and through the appointment by the President of a Board of Foreign Scholarships composed of ten leaders of education in the United States, which formulates policy and selects the grantees, a working partnership has been created between government and education under the general administrative direction of the Department of State. A further refinement in the operation of the program has been achieved by the designation of educational or scholarly organizations to conduct the public competitions for awards and to evaluate the qualifications of the students, teachers, and scholars who apply. It is in the screening of candidates for university lecturing and research appointments abroad that the Division of Biology and Agriculture of the National Research Council plays an important part.

The Fulbright program is also unique in its size and scope. At the present time the program extends to 24 countries in Europe, Asia, Africa and the Pacific. It provides opportunities for over 1,000 American citizens to go abroad annually and for an equal or larger number of foreign nationals to come to the United States. The size of the program for each country differs according to the amount of foreign currencies available. These amounts range from about the equivalent of $200,000 to a million dollars annually.

It is obvious that an exchange program of these proportions offers extensive opportunities not only to the academic population as a whole, but to scholars in each of the major academic disciplines or professions. Even after subtracting the large number of grants annually made to graduate students and to elementary and secondary school teachers, the residue of awards available for university professors and post-doctoral research scholars (the category with which this article is mainly concerned), is substantial. The extent of the opportunities provided by the program for advanced scholars in the general field of biology and agriculture may be inferred from the following table:

ANNUAL DISTRIBUTION OF FULBRIGHT GRANTS TO AMERICAN CITIZENS FOR LECTURING AND RESEARCH IN BIOLOGY AND AGRICULTURE

COUNTRY	48-49	49-50	50-51	51-52	52-53	53-54	TOTAL
Australia				4	3	3	10
Austria				1	1	3	5
Belgium		1	1				2
Burma	1	3	3	1	2		10
Ceylon							—
China	1						1
Denmark					2	2	4
Egypt			2	6	2	1	11
Finland							—
France			5	4	2	1	12
Germany						2	2
Greece			1		1	2	4
India			1	1			2
Iran			2				2
Iraq					2	3	5
Italy		2	2	3	2	4	13
Japan					1	1	2
Korea							—
Netherlands			3	3	2	3	11
New Zealand	1	6	2	1	1	1	12
Norway			2	2		2	6
Pakistan				1	4	1	6
Philippines	3	1	1			1	6
Sweden							—
Thailand					1		1
Turkey							—
United Kingdom		2	3	7	8	5	25
TOTAL	6	15	27	34	34	35	151

It will be noted from the above table that as the Fulbright Program approaches its maximum size, the number of awards granted to professors and post-doctoral scholars in the biological sciences is levelling off at approximately 35 each year. Since the total number of grants annually available for lecturing and research in all fields fluctuates between 350 and 375, it will be seen that scholars in the biological sciences receive only slightly less than 10% of all grants made. This percentage conforms very closely to the ratio of applications in biology and agriculture to the total number of applications submitted in all fields, the figures for the 1953-54 programs being 1850 in all fields and 170 in the biological sciences, a percentage of approximately 9%. Although there is no fixed quota of grants assigned to the biological sciences, or to any other subject field, a conscious effort is made to give equitable representation to all subjects. In general it may be said that a close correlation exists between the number of applications received and the number of awards made in each subject field.

The selection of grantees from among the various specializations within the biological sciences presents a much more

difficult problem. For a better understanding of this problem and the methods of dealing with it, it may be helpful to tabulate the actual distribution of awards among the various specializations in past years, and to describe briefly the principal mechanisms for screening applications.

DISTRIBUTION OF FULBRIGHT GRANTS TO AMERICAN CITIZENS BY GROUPED SPECIALIZATIONS—1948-53

Zoology and Related Sciences	54
Botany and Related Sciences	42
Physiology, Anatomy, Biochemistry, Pharmacology	36
Bacteriology, Microbiology, Parasitology	13
Agricultural Extension and Science Education	6
TOTAL	151

The difficulty of screening and selecting applicants for Fulbright awards in the biological sciences arises, as can readily be appreciated, from the extraordinarily high degree of specialization found within the general field. Ideally, there should be separate screening committees for the review of applications in each specialty. Since this is not feasible from the standpoint of administrative costs, the problem has been met by the appointment of standing committees in four major groups or families of specializations: the zoological sciences including their applications to animal husbandry and wild-life management; the botanical sciences including horticulture, plant industry, forestry, agronomy and soil science; the sciences of organic structure and function including physiology, anatomy, biochemistry and pharmacology; and the microbiological sciences including bacteriology, microbiology and parasitology. The four to six members of each of the four screening committees are nominated by the Division of Biology and Agriculture of the National Research Council and become advisory sub-committees of the central Committee on International Exchange of Persons of the Conference Board of Associated Research Councils, which has been entrusted with the over-all responsibility for screening applications and recommending candidates for Fulbright awards to the Department of State and the Board of Foreign Scholarships.

The establishment of four separate and independent screening committees provides to a reasonable degree a specialized approach to the problem of screening Fulbright applications in the biological sciences. On the other hand, this arrangement might easily lead to unevenness in the standards applied to the evaluation of the candidates in different specialties and consequently might be productive of inequities in the final selections. To prevent this, each of the committees is asked to employ similar criteria in making its judgments, and methods have been devised to coordinate the results of the four committees in a single ordered slate of candidates for the biological sciences as a whole. Several steps are taken to achieve this coordination. In the first place, the committees are instructed to evaluate each applicant against the whole body of scholars in his field of specialization rather than against the small sampling represented by the applications under review. In this way, each committee starts with a common frame of reference and is more likely to make judgments which are reasonably comparable. In the second place, each committee is asked to apply six principal criteria in rating the applicants: 1) his academic and scholarly qualifications and standing in the profession; 2) his personal qualifications, with particular reference to his ability to adapt to academic, cultural, and social life abroad; 3) the merits of his proposed program of lecturing or research and its relevance or suitability to the country or institution specified in the application; 4) the extent to which the applicant would be representative of academic and cultural life in the United States; 5) previous opportunities for study abroad; and 6) the applicant's age in relation both to the project proposed and to the benefits which may be expected to accrue to the individual and the profession from his overseas experience. Using these primary criteria, and such others as may be applicable, the committees are asked to rate each applicant in one of four major categories of recommendation: 1) recommended as outstanding, 2) highly recommended, 3) recommended as suitable or acceptable, and 4) not recommended.

A final and especially difficult step remains—the ordering of the candidates who have been equally well recommended for the same country, especially if they are competing against each other across subject-matter lines. For example, there may be three outstanding candidates for research in the United Kingdom, each of whom represents a different field of specialization and each of whom has been recommended with equal enthusiasm by the respective screening committees. Obviously an order of priority or preference must be established in the event that only one or two of the candidates can be accommodated. These are difficult decisions at best, and a joint meeting of the chairmen of each of the four committees is held each year to deal with such problems. The discussions over difficult choices may be lengthy and involve considerations which are often quite unrelated to academic competence, such as a geographically balanced distribution of the candidates in the United States, their distribution in host universities abroad, other opportunities for financial support, and veterans status (the Act specifies that consideration shall be given to previous service in the armed forces). As a result of the chairmen's meeting an ordered slate of candidates for each country is sent up to the Committee on International Exchange of Persons for consideration along with the reports of approximately fifty other advisory committees in other fields.

In spite of this carefully planned and professionally staffed screening mechanism, there are occasional evidences of a misunderstanding and mistrust of the selection process on the part of some scholars, particularly when a distinguished applicant is unsuccessful in the competition and a colleague of relatively modest attainments is selected for an award. In this connection, it should be kept in mind that the severity of the competition varies greatly from country to country, being exceptionally severe for the United Kingdom and the countries of western Europe, whereas for a few countries there may be an actual shortage of suitably qualified candidates. There is also relatively a much greater pressure for places in the research category than in the lecturing category. For these reasons, the reviewing committees often suggest to an applicant that he consider shifting his application from research to lecturing or from one country to another in which the prospects of an appointment would be much more favorable. Candidates are sometimes willing to make such shifts, especially when it is realized that the teaching responsibilities of visiting lecturers, particularly in the European universities, are ordinarily very light, leaving ample time for research. It is also not generally realized that a differential in the foreign currency allowances is now contemplated in most countries in favor of the visiting lecturer and that his liability to federal income tax is offset to a considerable extent by a small supplemental grant in dollars from the Department of State.

In the universities of the Near and Far East, although the teaching responsibilities of visiting lecturers are more demanding and leave relatively little time for systematic research, the opportunities for making a vital contribution to the development of science in the host countries are correspondingly great. Scholars whose reputations have been acquired and whose professional contributions have been made as much in teaching as in research are especially needed for lecturing appointments in the Near and Far East and are encouraged to apply for these areas. Furthermore, the personal qualifications particularly valued in the faculties of the liberal arts colleges of this country are important elements of success in teaching in the Near East and South Asia, and such appointments offer the able and experienced small-college professor excellent opportunities for participation in the program.

The opportunities available to the small-college faculty member are well illustrated by the selection of Dr. Robert K. Enders, Professor of Biology and Chairman of the Department at Swarthmore, for lecturing during the academic year 1952-53 at the University of Punjab, Lahore, Pakistan, and of Dr. Charles S. Thornton, Professor of Biology at Kenyon College, for lecturing at Fouad I University in Cairo, Egypt. Professor Enders writes of his year in Pakistan:

"They (The Department of Zoology, University of Punjab) assigned the class in Embryology in the graduate school to me. For two months I lectured to both the Master of Science groups and after that to the Master of Science Final students only. In addition to the lectures I spent full time in the laboratory. Since the latest book referred to in the Syllabus was published in 1926 my textbooks and laboratory manuals were most welcome. However, the question arose as to whether the external examiner would be familiar with recent findings since my books were the only recent ones available. Needless to say the texts were given to the University.

"In addition to the regular teaching a few lectures were given to undergraduates, a lecture trip to five colleges was made and several conferences were attended and one specialized lecture was given at a medical school. The most satisfying aspect of the work was the stimulation I was able to give a few of the younger staff members, the new techniques introduced and the warm friendships made. The opportunity to help is a continuing one, for my correspondence with these friends is heavy and we continue to send books, supplies and encouragement.

"Opportunities for research during the school year are nonexistent but independent research is possible during the summer vacation."

During his year in Egypt, Professor Thornton was attached to the Faculty of Medicine at Fouad I University in Cairo, where he gave courses in embryology. An important part of his program, however, were his visits to universities in Lebanon, Syria, and Turkey, where under the joint sponsorship of UNESCO and the United States Educational Foundation in Egypt he discussed problems of teaching in the biological sciences and assisted the universities in the Near East in obtaining professors in Zoology, Anatomy and Embryology.

There is, of course, much more to the Fulbright Program than the advancement of science in the international field or the professional benefits accruing to the participating scholars and institutions, important and central to the program as these objectives are. In a larger sense, it is the intangible by-products of educational exchange which the Program was originally established to secure. The Program is based upon the theory that an increasing flow of scholars, ideas and information between countries will help Americans to understand the problems and appreciate the achievements of the people of other nations and in turn help them to understand us. This is the stake which the public as a whole has in the Fulbright Program and this is the essential justification for so large an expenditure of public funds on an enterprise which is sometimes assumed by the immediate beneficiaries as being primarily for them. There need not be, however, any conflict between the individual and the public good. The grantees who have been most successful in carrying out their programs of teaching and research have by and large been those who have been most sensitive to the demands of personal diplomacy. These grantees have also been the most effective in winning respect for America abroad. To borrow a term from the biological sciences, the Program is an excellent example of "symbiosis" in national affairs. As the Fulbright Program becomes more successful in determining the common interests of the nation and its scholars, there will be increasing opportunities to serve both.

The Biologist in the Army Medical Service

ARVEY C. SANDERS, Lt. Col., MSC, USA

Department of Bacteriology, Army Medical Service Graduate School
Walter Reed Army Medical Center, Washington 12, D. C.

GENERAL George Miller Sternberg has often been called "The Father of American Bacteriology." As early as 1881 he described the *Pneumococcus* independent of the work of Pasteur, and in 1892 published one of the first text-books of bacteriology. It was under his direction as Surgeon General that the work of Major Walter Reed, resulting in the conquest of yellow fever, was made possible. Thus, from the very beginning of its golden era, biology as a science has been actively practiced in the United States Army.

However, it was not until April, 1917, that positions were created within the structure of the medical service for highly trained biologists without medical degrees. At the outset of World War I the Sanitary Corps was established as a component part of the Medical Department of the Army. Its officers included sanitary engineers, administrative specialists and individuals trained in various laboratory sciences. After the termination of hostilities approximately 100 officers of the war-time Sanitary Corps were commissioned in the newly organized Medical Administrative Corps. The assignments of officers of this corps were essentially administrative, and provided no career opportunity for the biologist. Consequently, between World War I and World War II, there was only one laboratory scientist without a medical degree on duty in the regular establishment. The National Defense Act of 1920 did, however, maintain the Sanitary Corps as a reserve organization, and thereby placed a small group of trained laboratory specialists on a stand-by basis.

During World War II medical laboratories of the Army were greatly expanded with the result that more than 1300 laboratory trained scientists were commissioned in the Sanitary Corps Reserve. The advances of medical science coupled with the splendid war-time performance of these officers emphasized the need for their services in the post-war medical service.

In 1947 the Army-Navy Medical Service Corps Act became law and provides, for the first time, spaces in the regular establishment for the biologist in the Medical Allied Sciences Section of the Medical Service Corps. It authorizes the appointment of bacteriologists, biochemists, parasitologists, immunochemists and entomologists as officers of the regular Army with career opportunities similar to those of the other Corps of the medical services. It connotes full acceptance of the biologist as a member of the military medical team.

The requirements for appointment in the Medical Allied Sciences Section of the Medical Service Corps are high. The candidate must be of excellent moral fiber, physically sound and possess an aptitude for military service. He must have obtained a Master of Science degree or a Bachelor of Science degree *plus* a certification as a Medical Technologist, and come

well recommended by his school and previous employers. Although standards such as these may appear high for initial appointment, they are basically essential for successful career development and competition. The military biologist must be capable of leadership, physically able to withstand the rigors of life in the field and be possessed of a genuine desire to become a "good officer." Wherever he serves in the Army in his role as a scientist he will find these to be requisites.

The scope of assignments for the biologist in the medical service of the Army is extensive and challenging, both at home and abroad. In the course of a career the allied sciences officer will usually experience duty in the station hospital, teaching general hospital, overseas field and general laboratories, continental Army Area laboratories, special Medical Research Units and eventually the Army Medical Service Graduate School. Concurrent with assignment progression there are many educational opportunities which include both short and long term courses at the Medical Field Service School, Army Medical Service Graduate School and certain civilian colleges and universities.

In the station hospital of 250 or more beds the bacteriologist or biochemist, for example, may find himself as the assistant to the Chief of Laboratory Service. An assignment of this type can prove to be of inestimable value later on, because it is here where the biologist can best observe the functions of a basic laboratory unit in its support of military medicine. Not only will he learn something of his responsibility to the patient and the physician, but also the importance of preventive medicine and public health practices.

The teaching general hospital is an institution, usually of 1000 beds or more, with a large and active laboratory service. Here the biologist plays an important role as a member of the professional staff. He will most often have the full responsibility of his section, bacteriology, biochemistry, parasitology, etc., under the direction of an officer of the Medical Corps who is a Diplomate of the American Board of Pathology. Excellent opportunity for experience in definitive diagnostic work and investigation is afforded by institutions of this type. Similarly, the opportunity to work with members of the entire laboratory team is both stimulating and incrassate.

Duty in the overseas field and general laboratories can be a most rewarding experience. The field laboratory serves a field Army, and is usually located close to the combat zone. Other than serving the immediate laboratory needs of the field Army to which it belongs, it also functions as a forward echelon of the general laboratory. The medical general laboratory functions as a central laboratory service for an entire theater of operations. It is charged with the responsibility of rendering definitive laboratory support to all medical installations in the theater and investigation of those indigenous diseases which could be transmitted to United States troops serving therein. Medical general laboratories are most often situated in areas of the world where opportunity for research and investigation are almost without limitations. The nature of this work brings the Army biologist in daily contact with indigenous scientists, hospitals and educational institutions which is, indeed, a broadening experience for the American scientist.

Continental Army Area laboratories serve the Army on duty in the United States in much the same manner the state board of health laboratories serve their respective states. Like the overseas general laboratory they offer excellent facilities for research and investigation. In his capacity of a department chief, i.e., Chief, Department of Chemistry, etc., the biologist is afforded an excellent opportunity to experience the responsibility of departmental administration relatively early in his career.

There are unique opportunities to engage in original field research as members of special Medical Research Units. Among such assignments may be mentioned studies on prevention of scrub typhus in Malaya and investigations on the etiology and transmission of hemorrhagic fever in Korea. Special Medical Research Units have also investigated such problems as schistosomiasis and leptospirosis in Puerto Rico, amebiasis and typhoid fever in Malaya and leech infestations and Japanese encephalitis in Borneo. In addition to assignments in such special Medical Research Units or in hospitals or Medical General Laboratories, both entomologists and parasitologists may be assigned to specific Preventive Medicine Units where they function as commanding officers or as officers in charge of sections in the units. Entomologists may also serve as assistants to preventive medicine officers on the staffs of higher commands.

The Army Medical Service Graduate School located at the Walter Reed Army Medical Center in Washington, D. C. is the largest and most extensive of all Army laboratories. In the organizational structure of this institution there are many responsible and exciting assignments for the Army biologist. Here he may engage in the most fundamental research or pursue investigation of the highest type. The opportunities for teaching are limited only by his experience. Among the faculty of this institution are men of national and international repute in science with whom he has frequent contact. The "School" brings together physicians, dentists, veterinarians and biologists, both civilian and military, with a common interest in science. A successful tour of duty in such an atmosphere serves well to prepare the Army scientist for the demands of the future.

Although the place of the biologist in the Army Medical Service is relatively new, the basic principles for a successful career have been well established. Briefly these principles are based on sound selection of candidates, progressive professional development, and competition. Probably most important is the fact that immobility and mediocrity will be accepted no less by the Army than by science itself. Therein lies the assurance of a full and gratifying career for the biologist in the Medical Service of the Army.

The Future Scientists of America Foundation

JOHN H. WOODBURN

Assistant Executive Secretary, National Science Teachers Association

EARLY in 1950 many people became concerned about certain trends in high school and college enrollments, in supply and demand for engineering and scientific personnel, and in the loss of active high school science teachers to military service and other types of employment. Many conferences and meetings were devoted to discussion of these trends. By 1952, the total situation was sufficiently clarified to allow the Professional Relations and Projects Committee of the National Science Teachers Association to go before its Board of Directors with a specific program proposal. Quoting a March 21, 1953 progress report submitted by Philip G. Johnson, Chairman of the FSAF Administrative Committee, the proposed program was based on six elements.

(1) An expanding economy based on progress and pre-

preparedness, (2) shortages of scientists, engineers, and technicians, (3) a serious decrease in the number of well-qualified high school science teachers, (4) falling enrollments in senior high school physical sciences and mathematics, (5) expanding enrollments in grades 7-8-9-10, and (6) a developing elementary school science program.

For various financial and legal reasons, the proposed program called for a new activity within the National Science Teachers Association. After lengthy debate and with legal counsel, THE FUTURE SCIENTISTS OF AMERICA FOUNDATION was chosen as the name of the activity. As an activity of the National Science Teachers Association the Foundation could operate under the Congressional charter of the National Education Association as an educational and scientific organization. This provided tax exemption under Section 101(6) of the Internal Revenue Code and precluded separate acts of incorporation for the Foundation. Accounting and auditing of the Foundation's funds followed the same procedure as for the basic accounts of the National Science Teachers Association.

Following favorable action by the NSTA Board of Directors in February, 1952, the plans were placed before representatives of several major industrial organizations with a request for funds to cover the expenses incident to developmental operations. The money contributed by twenty companies enabled those who were working on the proposal to translate tentative plans into the design of a definite activity. In July of 1952 the NSTA Board of Directors officially approved this activity. Again, quoting from Dr. Johnson's 1953 progress report, "individuals representing all major agencies known to be concerned with the problem were consulted face to face, time and again, and their ideas were thoroughly considered in the planning and development."

The leadership selected by the officers of the NSTA is broadly representative of the physical sciences, engineering, biological sciences, high school and college teaching, and science teacher education. The Administrative Committee is composed of Dr. Henry H. Armsby, U. S. Office of Education; Dr. Allen V. Astin, National Bureau of Standards; Mr. Robert H. Carleton, National Science Teachers Association; Dr. Charlotte L. Grant, President of NSTA, Oak Park and River Forest High School, Oak Park, Illinois; Dr. Philip G. Johnson, *Chairman*, Cornell University; Dr. Walter S. Lapp, President-Elect of NSTA, Overbrook High School, Philadelphia, Pennsylvania; Dr. Milton O. Lee, Federation of American Societies for Experimental Biology; Prof. Ralph W. Lefler, Purdue University; Dr. John S. Richardson, Treasurer of NSTA, Ohio State University.

Further representation for scientists, engineers, and industrial leaders is provided through a Board of Consultants. Each contributor to the Foundation and all appropriate professional societies are invited to name a member of this Board. Recognizing the need to keep its work closely coordinated with those agencies doing similar things at the college level, the Foundation has maintained close contact with the Engineering Manpower Commission of Engineers Joint Council, the Scientific Manpower Commission, and related groups.

In 1953 Dr. Johnson reported the Foundation's program as hinging on five proposed fields of action. These were:

> (1) Coordinating and strengthening career information and guidance services for high school students, (2) developing and extending science achievement awards for high school students, (3) expanding and improving specialized training opportunities for high school science teachers, (4) encouraging and managing awards to outstanding high school science teachers, and (5) promoting research on problems of high school science teaching.

Since March of 1953, the action of the Foundation has followed these proposed lines. *Encouraging Future Scientists: Available Materials and Services* has been prepared and is available from the Foundation's headquarters at no cost. This publication is a convenient listing of incentive, guidance, and specialized training services that are available for science students and their teachers.

A direct action program now entering its third year provides appropriate recognition for students who complete science projects and for science teachers who report their "best science teaching ideas" for 1953-54. Sponsored by the American Society for Metals, this program reaches many thousands of students in grades seven through twelve. It is an inspiring experience to examine the entries in this contest. Some examples are—an eighth grade boy's investigation of "Krilium—Soil Conditioner"; a ninth grade girl's study, "Can Chromatic Effects Be Induced in the Floral Envelope of the Narcissus?"; a tenth grade boy's project involving the "Ability of Micro-Nutrients in Producing the Cyclopean Effect in Gastropods"; and another tenth grader's problem, "Finding the Genetic Make-up of a Hooded Rat."

The teachers' phase of this program has proved to be quite fruitful. One-half of the teachers selected for recognition in 1952-53 were biology teachers. The papers which were submitted in 1951-52 were assembled in *Selected Science Teaching Ideas of 1952*. Through the generosity of several scientific societies, over 10,000 copies of this publication have been distributed.

The FSA Chart Contest sponsored by the W. M. Welch Scientific Company enabled the Foundation to expand the types of student activity being encouraged by the ASM program. Early returns indicate that teachers in more than forty states will participate in this program.

The Foundation is actively encouraging industrial groups to increase the number of specialized training opportunities that are available to high school science teachers during the summer months.

As an immediate service to teachers, the Foundation is distributing a pamphlet entitled, "*Let's Help Science Teachers Find Science-Related Summer Jobs in Industry.*" In regard to this last project, the Foundation's advisors have indicated that summer work experience for science teachers is educationally sound and that this is one of the most realistic and inexpensive ways for industry to follow through immediately with its desires to help the high school science teacher. In the words of one teacher, "This is a good idea for two reasons. Teachers will value the enrichment of their training that will come from industrial experience, and everyone will gain from letting industrial people see the ability and enthusiasm of the members of our profession."

As one phase of its research program, the Foundation conducted an inventory of teachers' opinions and experiences with sponsored career information and guidance services. The report of this inventory, *Encouraging Future Scientists: The Situation* has proved to be a valuable guide in planning future programs for science teachers and their students. Current research is being directed toward estimating recent trends in science course enrollment and in the supply and demand for science teachers.

The 1954 program of the Foundation also includes the preparation of a booklet designed to highlight the science teaching profession, its rewards, and the qualifications prerequisite to success in this profession.

Throughout all phases of its development and operation, the Foundation has actively sought the counsel and cooperation of all societies and organizations which share a common interest in the quality and quantity of science instruction that is available for the young people of America. Meetings of advisory and administrative groups have been marked by adequate opportunity for all participants to express opinions and offer advice. Endorsement and financial support provided by many scientific, educational, and industrial groups reflects the wisdom inherent in its development and holds promise of continued success for the Future Scientists of America Foundation.

INFORMATION ABOUT UNIVERSITY OF FLORIDA MEETINGS

September 5-9, 1954

American Bryological Society
American Fern Society
American Society for Horticultural Science
American Society of Ichthyologists and Herpetologists
American Society of Limnology and Oceanography
American Society of Naturalists
American Society of Plant Physiologists
American Society of Plant Taxonomists
Biometric Society (ENAR)
Botanical Society of America
Ecological Society of America
Genetics Society of America
Mycological Society of America
National Association of Biology Teachers
Phi Sigma
Sigma Delta Epsilon
Society of Protozoologists
Society for the Study of Evolution

MEETINGS: All society sessions will be held on the campus of the University of Florida.

FIELD TRIPS: Local committees of eight societies are making plans for trips. Some of these will be on or before Sunday, September 5 and pre-convention housing of trip groups in one dormitory is planned for persons arriving before Sunday. Those wishing such accommodations should notify John H. Davis, Dept. of Botany, University of Florida, giving date of arrival, number in party, and trip planned.

One long, four-day trip to tropical areas near Miami, in the Everglades National Park, the Florida Keys, and some coral reefs is planned for Thursday, September 2 through part of Sunday, September 5. This trip will be by bus and will probably not cost more than $35.00. It is being sponsored by the Ecological Society, but other persons are welcome. Anyone planning to make this trip should notify Dr. Davis before June 1.

FOOD SERVICES: Meals will be served in several University cafeterias from September 5 to 10. Purchased on an individual basis, meals will cost approximately $2.25 per day per person.

BANQUETS, SPECIAL LUNCHEONS: Facilities are available both on campus and in the city of Gainesville. Tickets for banquets should be purchased at the time of registration.

PUBLIC TRANSPORTATION TO GAINESVILLE: Eastern Airlines to Gainesville: National Airlines to Jacksonville: Delta-C & S Airlines to Jacksonville; Atlantic Coast Line Railroad: Seaboard Air Line Railroad (detrain at Waldo); Florida Greyhound Bus Lines. University officials plan to have a fleet of buses and cars available to meet all planes, trains and buses arriving in Waldo or Gainesville on Sunday, September 5.

WEATHER: During September the weather normally is hot but somewhat unpredictable. There is a possibility of heavy rains at this season. Many of the University buildings are air-conditioned.

RECOMMENDED CLOTHING: Sports clothes are the accepted garb except for banquets and similar functions. Men should feel free to wear open-collared sport shirts. Bathing suits should be included when packing.

HOUSING: The University will provide housing in dormitories for single men, single women, and families at $2.25 per person per night. Hotels and motels are also available. A housing application form will be found on the opposite page. The dormitories are comfortable and well located with reference to society meeting rooms and University eating facilities. Since the University is attempting to provide housing at the lowest possible cost it will be impossible to make refunds after the housing bill has been paid.

This is the first time that an AIBS-sponsored meeting has been held in the South and it is particularly fortunate that the University of Florida is the host institution. There will be no segregation on the University campus at society meetings, social functions, or eating places. Because of State laws the University is unable to provide housing for Negroes. However, arrangements have been made to secure Georgia Seagle Hall for the use of Negroes who plan to attend. This is a student residence hall operated by the Methodist Church. Located close to the campus, its facilities are equivalent to University dormitories. It will be serviced by University housing personnel and the same rates will apply. The University and the AIBS, of course, will have no control over social practices off the campus.

ENTERTAINMENT FOR FAMILIES: Among the plans being made for the entertainment of wives and children of persons attending the meetings are: (1) The AIBS tea on Sunday afternoon, September 5, (2) The University of Florida swimming and picnic grounds on Lake Warburg will be available all week, (3) A conducted bus trip to Silver Springs, Ocala, Fla., (4) A conducted bus trip to St. Augustine and Marineland.

MEETING OF BIOLOGICAL SOCIETIES

Sponsored by

American Institute of Biological Sciences

UNIVERSITY OF FLORIDA

Gainesville, Florida

September 5-9, 1954

INFORMATION ON HOUSING

DORMITORY ACCOMMODATIONS: University Dormitories will be available for housing couples and families as well as single delegates. Accommodations will be available also in hotels and motels in the City of Gainesville.

DORMITORY ROOMS MAY BE OCCUPIED: Any time from noon on Sunday, September 5th until 10 a. m. on Thursday, September 9th.

PRE- AND POST-MEETING HOUSING: Arrangements should be made by individual delegates through Dr. John Henry Davis, Department of Botany, University of Florida.

RESERVATIONS: Dormitories—May be made from now until September 2nd. Payment is to be made at check-in time. Hotels and Motels—May be made from now until September 2nd. The University Division of Housing will make reservations for you in off-campus housing but will not guarantee them.

RATES: Per Person in Dormitories, Sunday evening to Thursday at $2.25 per night. Hotel, $5.00 up. Motel, $5.00 up.

ACKNOWLEDGMENT: Each advance reservation received before August 26th will be acknowledged by a form which should be presented at the registration desk in September. Registration will be in the Main Lobby of Broward Hall, Inner Drive.

MEALS: No set cost. Cafeteria style with exception of banquets. Delegates will pay for and receive banquet tickets at registration.

TO MAKE ADVANCE REGISTRATION: Please fill out the registration form below and mail to:

D. W. Vermilye, Director
Division of Housing—Dept. "A"
University of Florida
Gainesville, Florida

(PLEASE TYPE OR PRINT ALL INFORMATION)

REGISTRATION AND HOUSING APPLICATION

Name ..... (first) ..... (middle) ..... (surname)

Male ☐ Female ☐

Home Address: ..... (street)

..... (city) ..... (zone) ..... (state)

Expected Time of Arrival: ..... (date, hour)

Full Names, Sex, Relationship of Members of My Party:

Departure: ..... (date, hour)

Arrival: By Train ☐
By Plane ☐
By Car ☐

Professional Address:

Title:

Institution:

Society Membership:

(1)

(2)

(3)

Please make reservations for me (and my party) in:

Dormitories ☐
Hotel ☐
Motel ☐

A typical dormitory on the campus of the University of Florida. Modern architecture has replaced the older Gothic stlye in many of the new buildings. Over 1,600 people will be housed in these new dormitories during the September meetings.

Florida Union, which will serve as general headquarters during the Gainesville meetings. The AIBS office will be located here as well as the Council Rooms of many of the societies. Some society banquets will also be held here. Immediately to the rear of the Union is the Botany Department building.

The Proper Titling of Medical Papers

A Brief Survey of the Problem

SEYMOUR I. TAINE
Editor, Armed Forces Medical Library, Washington, D. C.
and ROBERT L. HAYNE
Reviser, Armed Forces Medical Library, Washington, D. C.

ALTHOUGH Wilhelm Gottfried Ploucquet's *Literatura medica digesta* was published in 1808, the bibliographical problems discussed in its preface and introduction are still with us today, and the reader finds himself unable to check any of them off as entirely resolved. Most of them have indeed only been aggravated by time, and there is little satisfaction in realizing that their number has, at least, not grown.

One of Ploucquet's problems was the difficulty of handling articles inadequately titled. "Titles themselves," Ploucquet says, "are often highly unsatisfactory. They convey too little of, or suggest more than is contained in the substance of the work. What, for example, is conveyed by such titles as these . . . " and he lists *Observationes* and *Diaria* with the same irritation with which John Shaw Billings wrote 67 years later to the editor of the Philadelphia *Medical Times*, "If it were fully appreciated how much of the practical value of journal articles and the probability that the latter will be referred to by those seeking the information depends upon the title, it seems to me that more care would be taken by both authors and editors to see that the subject of the paper is properly described by its heading."

With the tremendous upsurge of scientific literature, it had become impossible by the nineteenth century for one man, as Albrecht von Haller had done in the previous century, to digest all of the literature, whether for his own purposes or that of bibliography, by reading, abstracting or scanning every article. The flood of medical literature which made the problem of more significance to Billings than it had been to Ploucquet has made it of even greater significance to us today. The volume of the literature has increased, its scope has broadened and deepened. Billings warned the medical profession that its work might, if improperly titled, be passed up by the researcher, even though made available by indexing. Proper titling does not imply doing the indexer's work for him—the indexer's problems are numerous without that addition. Hence Ploucquet's and Billings' irritation that they should be criticized for articles unindexed for lack of time or seemingly mis-indexed for lack of proper titles.

The careless author whose title is inadequate or misleading does more than endanger the dissemination of his own work; he endangers the proper dissemination of the work of others. Today the time needlessly wasted by indexers in discovering an author's intent substantially reduces the total number of articles indexed. It is therefore of more than passing interest to attempt an evaluation of the extent to which this shortcoming is prevalent today.

By virtue of the fact that it processes approximately 100,000 items annually, the staff of the *Current List of Medical Literature*, the monthly periodical index published by the Armed Forces Medical Library, is in a favorable position to note the characteristics and idiosyncrasies of the current literature. While no exhaustive study of the titling situation has been undertaken by us, certain aspects have come to our attention that are worthy of note.

The *Current List* staff has discovered few titles more opaque than those in which the author sums up his article with two words separated by "and." The correlation of such a title as "Adiuretin und Nebenniere; eine experimentelle Studie" (Arch. internat. pharm. dyn., Gand, 91:241-56, 1952) and the indexing explanation of "effect of adrenalectomy on the diuretic response to flickering-light stimulation in hyperhydrated salt-loaded guinea pigs" is perhaps readily apparent, but it is doubtful that the meaning would be so apparent before the fact, that is, before the indexing without other reference. It may be argued that in this case, as in many others, the juxtaposition of two such words is indication enough of the author's intent. Broadly speaking the argument is just, but research is rarely broadly done. It is for the most part specific and titles must be equally specific.

An equally careless method of titling, though one with more distinguished antecedents, is that represented by "Ueberlegungen zur Masern-Aetiologie" (Med. Mschr., 6:689-92, 1952). It recalls the days when any article on the subject was adequately headed by "*De morbillorum causa.*" It should not stand, however, as this one did, for a study correlating the epidemiology of measles with the fresh-water spawning of certain salt-water fish.

The two examples already given are both examples of one of two extremes. The other is the *embarras de richesses*, the case history complete, the veritable scenario, to which the article is a mere appendage. An example is superfluous.

Another dissatisfactory titler is the author who gives everything but the main point, the matter of which will be the indexer's main subject heading, and the researcher's primary line of attack. The title "Non-malignant lesions causing bleeding; diagnostic procedure and treatment" (J. Am. Geriat. Soc., 1:17-29, 1953) omitted what the author made clear in his first sentence: "This article concerns genital bleeding in women." One wonders why the information was not put where it belongs. It is not often that the necessary information is so readily available as in the first line, and all too frequently it may be necessary to read several paragraphs to get at it. Sometimes the information is contained in the journal's name or that of the society publishing it, and the indexer will have the information he needs, but not the researcher, who finds his journal titles usually in abbreviated form at the end of his reference.

A perhaps more justifiable, but still dissatisfactory type, is that represented by the title "Anatomische Bemerkungen zum Kopfschmerzproblem" (Münch. med. Wschr., 94:2609-11, 1952). The subject of this article was Horner's syndrome. Horner's syndrome was not, it is true, the author's main interest. The puzzle of headache was his interest, and he had found in an analysis of Horner's syndrome information he believed might be valuable in solving the puzzle. The meat of the article was nevertheless Horner's syndrome, and it should have been mentioned in the title. It is surprising that it was not, for the author had at hand a device universally favored by German titlers, the "zugleich ein Beitrag zu" conjunction so ideally fitted for categorizing the specific.

The most troublesome of all titles are those of the word-makers. The present complexity of the medical vocabulary becomes an invitation to exercise even greater ingenuity in renaming the old and naming the new. Greek roots are preferred, roots not generally used outside of Greek, those without international currency. It is usually necessary to alter them according to rules of euphony and orthography in the particular vernacular. Thus "disoria" has been used—the explanation hidden in the article—for a particular disorder of capillary circulation and permeability.

The indexer and researcher must ask, with the same regret with which Socrates banished poetry, that wit, cleverness and the happy turning of phrases be ignored in title making. There is a certain charm in such a title as "Discientifismo médico-pharmacológico por dispepsia mental" (Cons. gen. Col. med. Espana, Vol. 12, No. 64:51-4, 1952), but as Billings rather bluntly pointed out, there is no need to whet the appetite in scientific reporting. An audience is assured and it does not come to be amused.

The discussion of the titles cited has been entirely of a qualitative nature. Quantitatively, the situation appears to have improved since Billings made his historic complaint. This conclusion is, in the main, empirical. A recent preliminary study made at the Welch Medical Library points towards the substantiation of this premise. The results of that study showed that out of 207 subject headings supplied for 125 articles, 191 or 92% of the headings could be derived from the title alone, without recourse to an examination of the body of the article. If a larger, valid statistical sample were to bear out this tentative finding, it could well serve as an objective corroboration of the general improvement in titling of medical papers today. The effectiveness of all phases of scientific documentation will assuredly be increased by titling as briefly, accurately, and intelligibly as possible.

PLANT GROWTH SUBSTANCES
by L. J. AUDUS
1953. 456 pages, 43 illus., $6.50
Surveys for the chemist and plant physiologist the fundamentals and applications of plant growth substances.

A PRACTICAL MANUAL OF MEDICAL AND BIOLOGICAL STAINING TECHNIQUES
by EDWARD GURR
1953. 339 pages, $4.00
Laboratory procedures for all types of microscopic staining.

SWEET CORN
by W. A. HUELSEN
1954. 428 pages, 30 illus., $10.50
Presents all major facts about Sweet Corn from breeding and seed production to processing, canning, etc.

INTERSCIENCE PUBLISHERS, INC.
250 Fifth Avenue New York 1, N. Y.

Prentice-Hall
COLLEGE TEXTS

Winning Nation-wide acclaim

THE BIOTIC WORLD AND MAN

By

LORUS J. MILNE and MARGERY J. MILNE

University of New Hampshire

This popular biology text presents an integrated picture of the *whole science*, showing how the various branches interlock and interact. Its field is biology . . . rather than botany plus zoology.

550 photographs and 150 line drawings, many of them original, heighten student interest in this text. Charts, graphs, and tables are used liberally. Other outstanding features include:

- A detailed discussion of tools and methods in biology, with illustrations of types of microscopes and photomicrographs of microscopic techniques.
- Taxonomy and technical terminology kept to a minimum.
- Examples and illustrations drawn from all of U. S. and Canada, instead of mostly one region.
- Emphasis placed on the applications of biology.

There are no prerequisites for a course using

The Biotic World and Man

768 pages • 7″ x 9¾″ • Published May 1952

Send For Your Copy Today

PRENTICE-HALL, Inc.
70 FIFTH AVENUE
NEW YORK 11, N. Y.

OPTICAL INSTRUMENTS ZEISS WINKEL SINCE 1857, GOTTINGEN, ALLIED ZONE

STANDARD MICROSCOPE MODEL GF-525

An unusually efficient and flexible binocular microscope incorporating the very latest optical and mechanical innovations to make laboratory and research microscopy easy, fast and certain.

Various models are available, each equipped for, and suited to, the particular requirements involved.

The ZEISS WINKEL trade-mark is your guarantee of the most modern and finest equipment.

Write for free, detailed specifications

CARL ZEISS, INC. 485 Fifth Avenue, New York 17, N. Y.

Guaranteed uninterrupted repair service

JOSIAH MACY, JR. FOUNDATION

Announces three new books

METABOLIC INTERRELATIONS, Transactions of the Fifth Conference. Edited by: Edward C. Reifenstein, Director of Biological and Therapeutic Research, The Schering Corporation. **$5.00**

NERVE IMPULSE, Transactions of the Fourth Conference. Edited by David Nachmansohn, Associate Professor of Neurology, Columbia University College of Physicians and Surgeons. **$4.00**

PROBLEMS OF CONSCIOUSNESS, Transactions of the Fourth Conference. Edited by: Harold A. Abramson, Assistant Professor of Physiology, Columbia University College of Physicians and Surgeons. **$3.25**

These verbatim transactions of multidiscipline conferences concerning research progress, new methods, and theories enable the reader to share the give and take of authoritative investigations and make stimulating and exciting reading. Much of the material is unobtainable elsewhere.

JOSIAH MACY, JR. FOUNDATION PUBLICATIONS

SALES OFFICE: P. O. BOX 575, PACKANACK LAKE, NEW JERSEY

Please make checks payable to Josiah Macy, Jr. Foundation

WILEY BOOKS

GENERAL VIROLOGY

By S. E. LURIA, *of the University of Illinois.* This new book examines the viruses in their totality, stressing generalizations rather than oddities, and approaches to further work rather than details. The author discusses such problems as the "living nature" and the "origin" of viruses, and describes the relation of viruses to cancer. He considers the physical and chemical approach to virus particles and the cell-physiological approach to virus-infected host cells as two separate but integrated facets of the same continuing study. These dual aspects are given equal weight—the inert materials are interpreted on the one hand, the dynamic systems on the other. *1953. 427 pages. $8.50.*

INTRODUCTION TO VERTEBRATE EMBRYOLOGY, Fifth Edition

By WALDO SHUMWAY, *Stevens Institute, and* F. B. ADAMSTONE, *University of Illinois.* Organized on a comparative basis, this revised edition provides a general account of the developmental process. It is supplemented by detailed material relating to the amphioxus, the frog, the chick, and man. The subject matter under consideration is treated both from the morphological and physiological viewpoints. Non-essentials are avoided as much as possible and the material is organized so that a good choice of subject matter is possible. *1954. Approx. 382 pages. Prob. $5.75.*

A LABORATORY MANUAL OF VERTEBRATE EMBRYOLOGY, Third Edition

By F. B. ADAMSTONE, *University of Illinois, and* WALDO SHUMWAY, *Stevens Institute of Technology.* This manual substitutes a thorough, careful study of the anatomy of certain development stages of the frog, chick, and pig for the time-honored method of drawing a few individual and supposedly representative sections of these forms. *1954. 102 pages. $2.50.*

BIOCHEMICAL PREPARATIONS, Volume III

Editor-in-Chief, ESMOND E. SNELL, *of the University of Texas.* This is the third volume in a continuing series whose purpose is to provide readily duplicable and checked procedures whereby research biochemicals not easily available from commercial sources can be prepared in a state of known purity. 24 procedures are included. *1953. 128 pages. $3.50.*

ELEMENTS OF STATISTICS

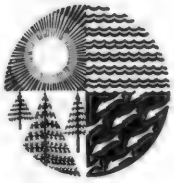
By H. C. FRYER, *Kansas State College.* Stresses the understanding and use of statistics. *One of the* WILEY PUBLICATIONS IN STATISTICS, Walter A. Shewhart, *Editor. 1954. 262 pages. $4.75.*

METHUEN MONOGRAPHS

The Biochemistry of the Nucleic Acids, by J. N. Davidson. *1954. 200 pages. $2.25.*
Tissue Culture, Second Edition, by E. N. Willmer. *1954. 175 pages. $2.25.*
The Metabolism of Algae, by C. E. Fogg. *1953. 149 pages. $2.00.*

Send for on-approval copies.

JOHN WILEY & SONS, Inc., 440-4th Ave., New York 16, N. Y.



HEATH SCIENCE TEXTS

SNYDER

The Principles of Heredity, Fourth Edition

The Fourth Edition of this text contains the latest findings in the rapidly developing field of genetics. "The best elementary text on the subject to present to beginning students."

HENRICI AND ORDAL

The Biology of Bacteria, Third Edition

"By far the best text in the field."
"Have used this text several years with satisfaction."
"Rates high in its particular field."

STOVER

An Introduction to the Anatomy of Seed Plants

D. C. Heath and Company

SALES OFFICES: NEW YORK 14 CHICAGO 16 SAN FRANCISCO 5
ATLANTA 3 DALLAS 1 HOME OFFICE: BOSTON 16

THE MAJOR FEATURES OF EVOLUTION. GEORGE GAYLORD SIMPSON has integrated a wide range of new knowledge with his famous earlier work TEMPO AND MODE IN EVOLUTION to give us this new and important standard work. He views the history of life as seen in the fossil record, evaluating and synthesizing the newest findings from the many sciences that bear on evolution. **$7.50**

MITOSIS: The Movements of Chromosomes in Cell Division. FRANZ SCHRADER. This second edition of another standard work is revised to include the many new discoveries and advances made in the field since 1944, the year of the first edition. **$4.00**

THE ENERGETICS OF DEVELOPMENT: A Study of Metabolism in the Frog Egg. LESTER G. BARTH and LUCENA J. BARTH. In this contribution to chemical embryology, the authors correlate their own findings with that of others in the study of the energetics of development. *Columbia Bicentennial Editions and Studies* *probable price* **$3.00**

BCG VACCINATION: Studies by the World Health Organization Research Office describes international research into the many aspects, disputes, and technical problems surrounding BCG vaccination. Covering three years, the study covers such matters as the effect of temperature, duration of storage, exposure to light, dilution of the vaccine, and various methods of producing the material to be used. " . . . a valuable 'source book' . . . many valuable findings."—*Chicago Medical School Quarterly. A publication of the World Health Organization.* paper, **$3.00**

Columbia University Press • 2960 Broadway • New York 27, N. Y.

NEW HORIZONS IN *The Teaching of* GENERAL BIOLOGY

BIOLOGY

679 pages

$6.50

PAUL B. WEISZ, Associate Professor of Biology, Brown University

NEW HORIZONS

This book reaches for new horizons in the teaching of *General Biology*. An original and novel approach is presented, designed not only to give thorough insight into modern biological thought, but also to make reading and studying *enjoyable*.

INNER REASONS

All major facets of biology are forged into a rigorously integrated, logically developed account with stress always on concepts and understanding, not fact and memory. Beyond the discussion of biological principles, the book searches for the inner reasons behind the principles. The old and the new, the complex and the simple, are all smoothly coordinated into a unified *natural* scheme; and artificial slants toward particular phases of biology are avoided.

DIFFERENT LITERARY STYLE

Special features of the book are abundant, distinctive illustrations; and its excellent literary style—narrative, lucid, often dramatic, and approaching that of a novel as much as possible.

HORIZONTAL AND VERTICAL

Strategically, a key innovation is the horizontal and vertical organization of the subject matter. The whole field of biology is developed out of four basic concepts: environment, living substance, metabolism, self-perpetuation.

Within this horizontal framework, every biological phenomenon falls easily and automatically into its appropriate wider setting, without loose ends. Thus the reader is enabled to perceive clearly how each aspect of biology is dramatically interrelated with all other aspects.

Vertically, the material is organized into unfolding levels of complexity: each level is a self-contained unit, and from one level to the next, detail and depth increase progressively. What is a chapter section on the first level becomes a whole chapter on the second level and a whole group of chapters on the third. Thus the reader is led forward gradually and has a real chance to absorb as he goes along.

This approach also allows the teacher to select from, or to expand beyond, the scope of the book, without losing the integrity of the organization. Moreover the book becomes the solid foundation on which higher levels of detail may be smoothly superimposed in more advanced courses.

Send for a copy on approval

McGRAW-HILL BOOK CO., Inc.

330 West 42nd Street **New York 36, N.Y.**

M · M · M · M · M · M · M · M · M · M · M · M · M · M · M · M · M · M · M · M · M

Announcing

NEW MACMILLAN TEXTS

HUMAN PHYSIOLOGY

by W. B. Youmans

Here is a concise but thorough text in human physiology designed for college students who have had either no college science or just one course in general chemistry or general zoology. Containing numerous descriptions of actual experiments, the arrangement of the material is adapted to courses which include laboratory work. The essentials of anatomical and physical principles provide a brief introduction to specific sections and to the chapters on muscle, nerve, reflex action, blood, circulation, and respiration.

Ready in May.

MICROBES AND YOU

by Stanley E. Wedberg

The fundamentals of bacteriology are here presented as a vivid, living science with practical application for those students taking a one-semester terminal course in the field. Written in a readable, informal style, this concise text not only covers bacteria, but also includes molds, yeasts, rickettsiae, and viruses. The history of microbiological research is uniquely interwoven into the first few chapters to provide the student with interesting and vital background material.

Ready this month.

The Macmillan Company

60 FIFTH AVENUE, NEW YORK 11, N. Y.

M · M · M · M · M · M · M · M · M · M · M · M · M · M · M · M · M · M · M · M · M

RESEARCH LABORATORY
THE AMERICAN TOBACCO COMPANY
RICHMOND, VA.

Quality of product is essential to continuing success

The American Tobacco Company
INCORPORATED

FIRST IN CIGARETTE RESEARCH